FOOD ENGINEERING

SEPTEMBER, 1957
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What electronic "brain" can do (p. 69)

GF aims at prestige (p. 74) • When FDA inspects (p. 78)

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FOOD ENGINEERING

SEPTEMBER 1957

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ABBE-3L REFRACTOMETER
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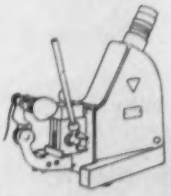

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Aimed at Prestige

To contribute something to the corporate image. . . That is a prime purpose behind the decision of General Foods' management to launch a line of gourmet foods.

The item above is typical of the 55 fancy foods in the line. It is "the best available," in a package of distinction.

Behind this pioneering project are significant management, marketing, and packaging principles. (See page 74).

Where to Use the "Brain"

No doubt about it, food manufacturing is fraught with extremely complex problems. That's why food companies are turning to electronic computers. These don't think, but they certainly can quickly digest a forbidding list of related data. And they can give you the one answer that best fits a situation. Read about it on page 69.

Prepare for Inspection

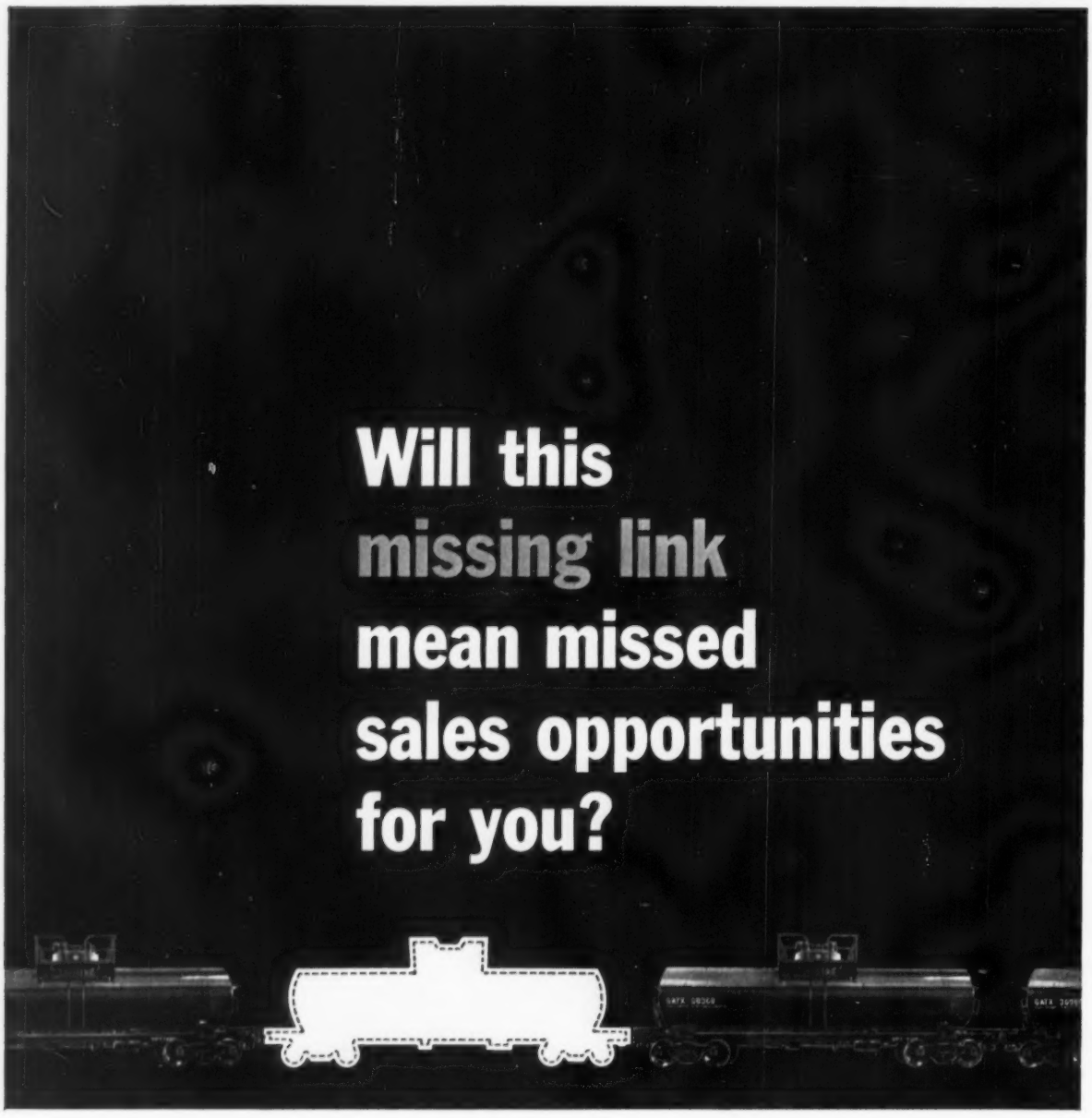
You'll be seeing more of FDA's food plant inspectors. This shouldn't worry you if your house is in order. But it could be a bit serious if you're caught by the inspectors with your sanitation down.

Tips that will help you to meet inspections without demerits—and protect yourself if you don't—are presented in the article on page 78.

Outstanding New Plants

There's much more to efficient food manufacturing operations than advanced processing and packaging lines. Location of the factory, its construction features, and a multitude of "hidden services"—such as electrical distribution—are big cost and profit factors.

That is why FE will give you in October a 20-page special report on the non-processing features of outstanding new food plants. We think you'll profit from the planning and engineering done by pacesetters like Heinz, Carnation, Swift, Pepsi-Cola and Carlings.



You'll want every general-purpose tank car you can lay your hands on in the decade ahead. Forecasts point to booming production and sales, and a vastly increased demand for shipping facilities. But normal obsolescence affects tank cars, too. A shortage of steel, plus the time required to build, will make for scarcity. That's why alert businessmen are already examining transportation requirements—planning for tomorrow's markets . . . today.

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TRENDS & FORECASTS

Special

FOOD ENGINEERING

Service to Executives

Cost of primary materials and labor for factory construction was up 3.7% at mid-year compared to a year earlier, according to *Engineering News-Record*. Contractor's prices were 5.8 higher. Little further increase in materials and labor is expected in '57. Contractors' prices may drop.

Savings exceeding $1 million in a year from making its own cans are expected by Hawaiian Pineapple Co. The figure is based on experience since last November. The firm will make 400 million cans in a year.

The consumer price index was up 4.8% at the end of June, compared to March, '56. One-fourth of the reduced value of the dollar could come out of food purchases. But incomes were 5.4% higher in April '57 than a year ago.

Sales potential has not been scratched for fancy foods and confectionery, according to National Assn. for Specialty Food Trade. Demand increased 15% in first half of 1957, on top of a $39 to $45 million rise in '56.

New products developed or acquired since World War II accounted for 35.6% of net sales of General Foods for the past fiscal year. This points up the value of research, for which the firm spent a record $8.1 million last year.

Significance of processing to sales is currently exemplified by apples. Popularity of convenient canned items steadily rises. But fresh fruit demand is declining faster than processing is increasing.

Most industries are short of labor. And no relief is in sight until 1965, when the bumper crop of war babies reaches working age. More labor-saving automation will be necessary.

Food Shipping Rates Rise

Food manufacturers will be paying higher freight rates soon. The nation's railroads have been granted permanent freight rate boosts by the Interstate Commerce Commission.

New rate increases are 7% for Eastern and Western roads, and 4% for Southern lines, to go into effect on 15 days' notice.

The ICC, however, specified lower carload rate increases—11c. per 100 lb.—for most foodstuffs. Taking the lower rate will be canned or preserved food products; fresh fruits, including citrus; vegetables; melons; and fruit or vegetable juices and concentrates (frozen or cold packed).

Temporary freight increases approved by the ICC last winter—7% for Eastern roads, and 5% for Western and Southern lines—were made permanent. This adds up to overall permanent rate hikes of 14% for Eastern roads, 12% for Western, and 9% for Southern lines. Class rates were authorized to be hiked 12% in and between the Eastern, Western, and Southern territories.

Eastern and Western railroads were seeking a 22% boost in rates, and Southern lines wanted a 15% hike.

Shippers can look for truck and water rates to increase by about the same percentage as the rail boosts.

Food Loans Cost More

What does the recent increase in the prime interest rate (from 4 to 4½%) mean to food firms obtaining future commodity loans?

A big West Coast bank puts it this

Ask Standard

how to cut costs with conveyors

Although over 19,000 items are stocked, conveyors permit fast and efficient assembly, checking and packing — orders ride safely in durable, lightweight tote boxes.

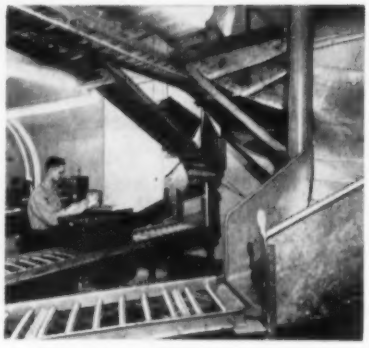
Milwaukee wholesale drug firm

ups order-filling 50% with 3-floor conveyor system

WITH conveyors, The F. Dohmen Company, Milwaukee, Wisconsin, designed a system which has permitted them to fill upwards of 50% more orders per day . . . reduce to a minimum, excessive overtime costs . . . reduce errors, delays and merchandise damage. Standard belt and roller conveyors connect every department in the firm's three-story warehouse.

This installation is typical of what Standard can do to solve material handling problems. Standard designs and builds permanent and portable systems and units, using roller, belt, slat, chain, pushbar or sectional conveyors — power or gravity; also spiral chutes and pneumatic tube systems.

For complete facts, consult STANDARD CONVEYOR COMPANY, General Office: North St. Paul 9, Minnesota. Sales and Service in Principal Cities.



Floor-to-floor route of conveyor system assures minimum wasted motion by employees. Above, "close-out" checker makes final inspection of orders.

For details on Standard Conveyors of all types, contact the Standard representative listed in your classified phone book or write direct. Ask for Bulletin D 9.

Trends & Forecasts

way: ". . . in general, rates are going up. But there will be no across-the-board increase by this bank. It is expected that we will be fair and equitable."

A leading Eastern bank says: "It means ¼% higher interest rates for commodity loans in general–the actual rate varying with the risk."

Small firms ordinarily pay more than the large borrowers. One of the smaller California frozen packers paid 6% last year, 6¼% this year. And he expects this rate may go to 7% due to the prime rate increase. And foods are frozen in California all year 'round.

Too Many Cling Peaches

California's whopping 21 million case pack of cling peaches in 1956 left a 4.5 million case carryover as of June 1.

To equalize this market, growers have had to reduce their crop (estimated at 680,000 tons) to 520,000 tons, delivered weight, by the "green-drop" method. This latter figure will produce some 16-17 million cases of peaches this season.

Strawberry Pack Up

Only in California have Nature and a cautious packer attitude reduced the frozen strawberry pack. At the end of July, the pack there was only 55½ million lb., compared to 99.7 million lb. at the same time in '56.

Another reason for this short pack could be the brisk demand from the fresh berry market.

In other West Coast states, the pack is higher this year. Oregon has produced 86.5 million lb., compared to last year's pack of 66 million. Washington bounded back from the '56 freeze (9.3 million lb.) with over 38.4 million lb. this year.

All other strawberry producing states have increased their output.

Plenty of Fats and Oils

Supplies of food fats and oils are expected to continue at a high level in coming months. That is the forecast of USDA's Agricultural Marketing Service.

Indications are that civilian consumption during the first half of 1957, as measured by disappearance into civilian distribution channels, did not equal a year earlier. But

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fmc Continuous Vertical Screw Press

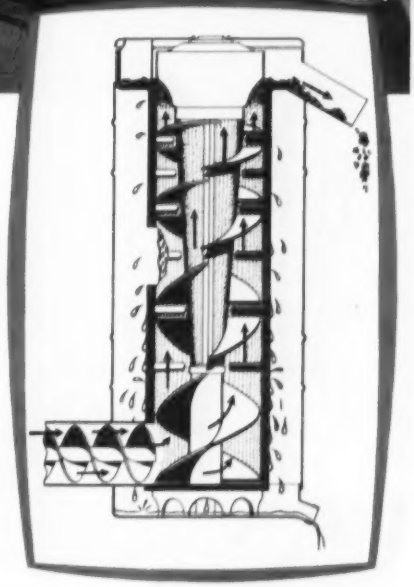
New "Counter-Flow" Design Produces Highest Fluid Recovery

Actual operating results prove conclusively that the FMC Vertical Screw Press greatly increases the overall efficiency of juice or fluid extracting operations. Its pressing action is gentle, resulting in an improved product quality even while obtaining higher fluid recovery. Reduced handling and disposal costs of low moisture content wastes provide even further savings.

In operation, press cake is quickly and easily formed at start-up; "channeling" is eliminated, preventing loss of unpressed material; flow of fluid is downward – doesn't re-wet the dry pomace. And this press is easy to clean. The outer screen frame is opened on hinges, and the center spindle and components are reached by releasing a single quick-opening clamp.

Full information is available on request. Just write, or call your nearest FMC representative.

Vertical Screw Press in a tomato line at the Oakland plant of F. M. Ball & Co., Div. of Hawaiian Pineapple Co. Installation was made and *paid for itself in one season!* These units permit more flexible use of pulpers and finishers on tomato products, resulting in reduced screen wear. Gentle pressing action of moist pomace means high product quality – even while greatly increasing recovery.



Drawing illustrates FMC "Counter-Flow" design, shows pressure feeding of material at bottom of machine, upward travel and discharge of pressed solids at the top.

fmc Key to good equipment

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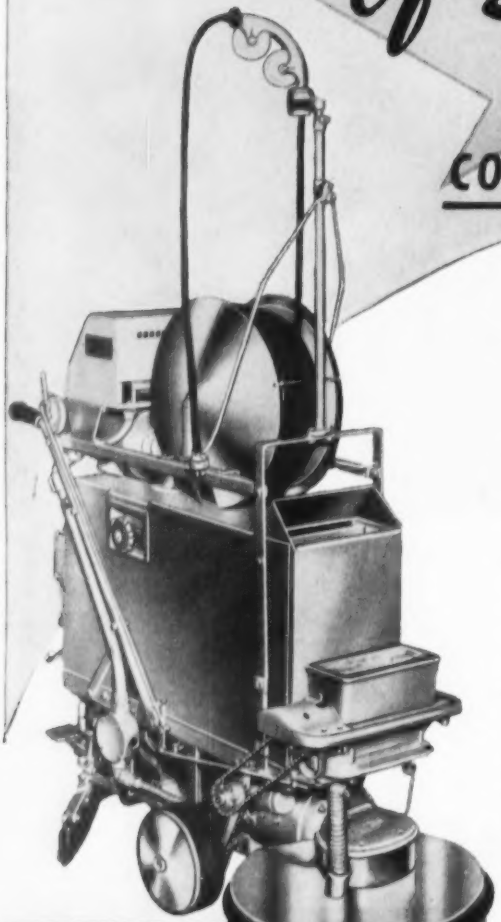

...Also can be used for dry work — steel-wooling, et cetera

(Powder Dispenser is an accessory)

Today, even buildings with but 2,000 to 15,000 sq. ft. of floor space can reap the labor-saving, cost-reducing benefits of *combination-machine-scrubbing*. Here's a *Combination Scrubber-Vac, Finnell's 418P* at left, that's specially designed for such buildings. This *electric* unit, with its 18-inch brush spread, cleans floors in *approximately one-third the time* required with a conventional 18-inch machine and separate vac.

The *418P* applies the cleanser, scrubs, and picks up (damp-dries the floor)—*all in one operation!* Maintenance men like the convenience of working with this single unit... the thoroughness with which it cleans... and the features that make the machine simple to operate. It's *self-propelled*, and has a *positive* clutch. There are no switches to set for *fast* or *slow*—slight pressure of the hand on clutch lever adjusts speed to desired rate. The powerful vac performs quietly. Compactly built, the *418P* also serves advantageously in larger buildings for the care of floors in narrow aisles and congested areas, and is available on lease or purchase plan.

Finnell makes *Scrubber-Vac Machines* for small, vast, and intermediate operations, and in *gasoline* or *propane powered* as well as *electric* models. From this complete line, you can choose the size and model that's exactly right for *your* job (no need to *over-buy* or *under-buy*). It's also good to know that *a Finnell Floor Specialist and Engineer is nearby* to help train your maintenance operators in the proper use of the machine and to make periodic check-ups. For demonstration, consultation, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 5709 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

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some increase is expected during the remainder of 1957.

For the year as a whole, consumption per person probably will average a little below 1956. Retail prices of fats and oils food products averaged somewhat higher during the first half of this year than last.

Data on primary movement into civilian markets indicate that the consumption rate of margarine and "direct-use" lard in the first half of 1957 was about the same as a year earlier. Total use of lard—direct and indirect—was higher. Some decline was indicated for cooking and salad oils, shortening, and butter.

The seasonal downturn in lard production will soon end. But output in the second half of this year is expected to total no higher than in the same part of 1956. Crushings of a large crop of oilseeds in prospect will expand seasonally in the fall.

Frozen Food Boom in Sweden

Sweden's frozen food business has snowballed in recent years, and now is claimed to be the best developed in Europe. More than 400 items may be bought in 10,000 grocery stores.

In 1955, Sweden's 7.3 million people bought 10,000 to 11,000 tons of frozen foods. For 1956, the consumption is estimated at more than 16,000 tons. Frozen fish fillets rose from 10% of total fish consumption in 1954 to about 20% in 1955 and substantially more in '56.

High-quality products result from extensive research by a few large firms and by the official research institutes for deep-freezing and food preservation.

Widespread promotion has been done by the Swedish Bureau for Frozen Foods, affiliated with the Academy of Engineering Sciences. Time and labor saving with frozen foods has been publicized by the Home Research Institute.

For the Swedish housewife, who to a very large extent is also employed outside the home, quick-frozen foods have meant great relief.

Quick-frozen products include chicken (whole or cut up), a wide variety of vegetables (some of them entirely new on the Swedish market), berries, juices, dough, bread, and, above all, fish and shrimp.

Ready-cooked dishes are available, but Swedes seem to prefer uncooked foods.

Foods are frozen in refrigerated public warehouses, as well as freez-

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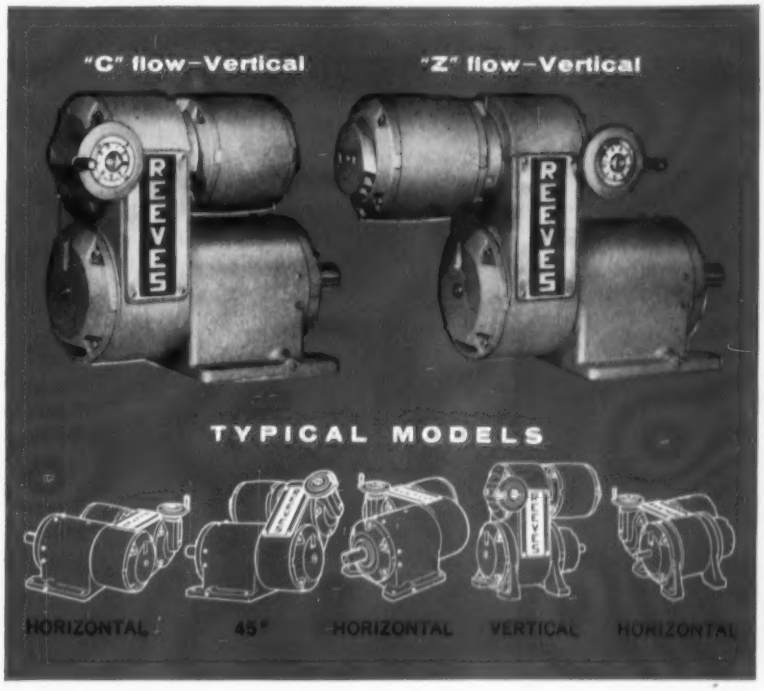
*Sizes 200-300 Vari-Speed MOTODRIVES**

*200-300 Size, 1 through 5 hp.; full line, ¼ through 40 hp.



The flexible design of these compact new REEVES variable speed power packages permits hundreds of combinations . . . space-saving, space-fitting *standard* assemblies to meet most installation requirements. All models are available in both "C" flow and "Z" flow styles.

New increased capacity is built in the reducers—single, double or triple stages . . . new disc assemblies permit wider output speed ranges . . . discs are pre-aligned . . . pre-loaded spring maintains correct belt tension for longer belt wear . . . *exclusive* "close-grooving" lubrication assures free sliding discs . . . new Metermatic system automatically lubricates the motor and variable shaft bearings.

Complete information on all phases of the versatile 200-300 sizes Vari-Speed Motodrives is given in new Catalog. Write for your free copy today—Dept. FE32a-M571.

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Division of **RELIANCE** ELECTRIC AND ENGINEERING CO.

Columbus, Indiana

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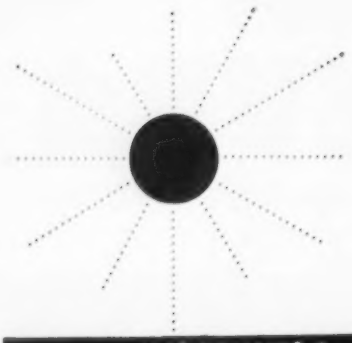

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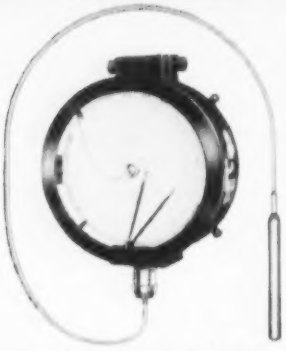
partlow

THE PIONEER IN MERCURY THERMAL CONTROLS



Recording Temperature Control

Degrees mean dollars. That's why Partlow Controls are used in more and more applications where temperature control is critical. Their pin-point accuracy insures positive protection for materials and equipment. Partlow Controls are precision-built for use with gas, oil, steam or water valves; or electrical equipment. Available in 9 standard ranges, from –30° F. to 1100° F.

THE PARTLOW CORPORATION
Dept. F-957, 2 Campion Road, New Hartford, N. Y.

We'd like to know more about Partlow Temperature Controls.
☐ Have representative call. ☐ Send us your CONDENSED CATALOG.
We are interested in Partlow Controls for the following applications:

Company
Street and Number
City State
Signed

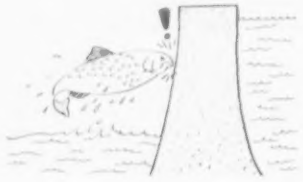
Trends & Forecasts

ing-in-transit vehicles (railway cars and trucks).

Sweden has gained a large export market. Its frozen peas and spinach are popular in England, and its fish in Germany. The Stockholm delicacy, stromming, a small Baltic Sea smelt or herring, is exported whole in deep-frozen state at a rate of some 1,500 tons annually—not to be retailed as such, but to be canned.

HORS D'OEUVRES

▶ **Of the 37 breads of the world analyzed at MIT, only one outranks ours nutritionally—a Finnish semi-white product. Among U. S. breads, enriched white is tops. Anyone criticizing our bakers has a lot of crust.**



▶ **How to get salmon over dams and back is causing Pacific Northwest utilities no end of headaches. The engineers have tried fish ladders, elevators, lifts, skimmers, and ski jumps. But the salmon continue to be a dam nuisance.**

▶ Borden's home-delivery customers in New York must pay a penalty fee if they fail to buy a minimum quantity. Sort of a back door cover charge.

▶ **Comes now Slenderella bread—with more proteins, minerals, and vitamins. 'Tis intended to keep the ladies healthy while they slash the calories in the battle of the bulge.**

▶ And the Slenderella promotion boys toss a cute curve with this line: "Helps you put food on a diet!" Only, who in our business wants to accomplish that?

▶ **As Secretary of Defense, Procter & Gamble's Neil H. McElroy should be able to keep the Navy afloat, if not 100% pure.**

▶ A marketing expert has advised candy makers to lift their products out of the "slightly sinful" category and sell in a positive manner. So no more of that "candy is dandy . . ." thinking.

▶ **Now the rage on Madison Avenue, motivation research involves finding out why people behave like people. Even the experts admit that it isn't easy.**

The Challenge of Leadership

The Griffith organization tries to outdo itself—living a precept of "*just as good isn't good enough!*"

It's spirit of that character that delivers the higher standard of flavor quality and uniformity you've come to expect in Griffith products. It's contagious! It's continuous! . . . from and to our salesmen in the field, from and to the men who manage, from and to the laboratory staff, to and from the men who manufacture the products, to and from the men and women who package them. *Griffith challenges itself, to do it better for you!*

THE GRIFFITH LABORATORIES, INC.
CHICAGO 9, 1415 W. 37th St. • NEWARK 12, 37 Empire St.
LOS ANGELES 58, 4900 Gifford Ave.

It must be ~~good~~ Better (for you) to bear the name

Griffith

★ ★ ★

*PEPPEROYAL® and SOLUBLIZED SEASONINGS. Better and predictable flavor quality — in fast dispersible form. Packed airtight in unit or batch-size bags.

★ ★ ★ ★ ★ ★ ★ ★

KRUSTO Batter and Breading Mixes for meat, fish, and fowl items. Rich flavored made of "crumb" loaf—fat-free for higher pick-up.

For more data, circle this page number on card at back →

BAKERIES utilize modern ENDURO-made equipment to produce high quality baked goods at the lowest possible cost. This machine automatically greases pans for mass production baking. It's ENDURO inside and out for cleanability and wear-resistance. ENDURO never adds unwanted flavor. It never takes anything away. It speeds clean-up time and assures sanitation.

CANNERIES processing citrus fruits and juices, rely on ENDURO to keep maintenance and replacement costs at an absolute minimum. ENDURO is unaffected by the highly corrosive action of citric acids. And because ENDURO is solid stainless throughout, there is never any need for refinishing or restoring its smooth, hard, dense surface.

STAINLESS STEEL—

CONCENTRATES, relative newcomers to the industry, are naturals for processing in ENDURO-made equipment, such as this spray dryer. Quality and true flavor are protected because all product-contacting parts are stainless steel. Operating and maintenance costs are kept low because ENDURO maintains its strength, toughness and corrosion resistance all the way from below freezing to blistering heat.

BREWERIES discovered years ago that ENDURO Stainless Steel is a valuable asset in producing beer with predictable and unvarying flavor, purity and clarity. ENDURO is completely inert in the presence of wort and beer. Danger of metallic contamination is eliminated. ENDURO's easy-clean and easy-to-keep-clean qualities mean that equipment has more productive hours and extra earning capacity.

FOOD PROCESSORS discussed on these pages selected ENDURO Stainless Steel for various reasons. All are benefiting from *faster production, elimination of spoilage, high bacterial cleanability, lower costs and higher product quality.* Shouldn't you be enjoying these same advantages? Your equipment supplier has all the facts. Or send us the coupon.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

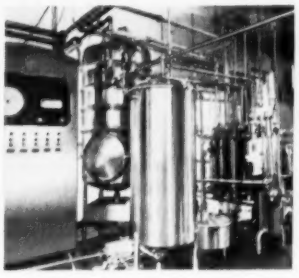
← For more data, circle this page number on card at back

MEAT PACKERS have found in ENDURO the ideal material for use in processing stabilized, uniform, uncontaminated, smoked meats. A stainless steel, air-conditioned smoke house, of the type shown above, pays for itself in a year's time through savings in heating, cleaning and labor costs. ENDURO is unaffected by rapid temperature changes or the corrosive action of fatty acids.

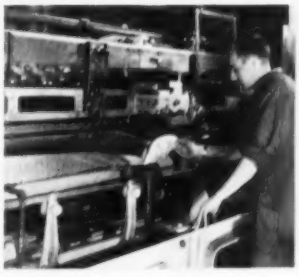
DAIRIES know from over a quarter century of experience that no other commercially available material equals stainless steel for ease and thoroughness of cleaning. Additionally, ENDURO-made dairy equipment offers ruggedness, elasticity, abrasion-resistance and impact-absorbing qualities that minimize maintenance and down time for repairs or adjustments. ENDURO is the perfect metal for nature's most nearly perfect food.

Food Processors' Biggest Bargain

No other commercially available material offers so many advantages. Select stainless for a specific purpose, such as minimum maintenance, and automatically get all of its "bonus benefits". Read how Republic ENDURO® Stainless Steel helps 6 segments of the industry keep costs low, quality high.



FOOD PROCESSORS ELIMINATE CONTAMINATION and discoloration by conveying food, dairy and beverage products through Republic ELECTRUNITE® Stainless Steel Tubing and Pipe. Outstanding corrosion-resistance and a wide range of resistance to temperature, pressure and physical damage mean that ELECTRUNITE will last indefinitely. Available in bright annealed and polished O.D. and I.D. surfaces. Send coupon for complete details.



FOOD, MEAT AND FISH PROCESSORS using salt or brine can end costly corrosion problems with Republic Titanium. It is impervious to the corrosive effect and pitting action of salt water and brine. Titanium is inert. It will not contaminate food products. Titanium equipment is easy to handle. It is as strong as steel, yet weighs only 56% as much. Republic metallurgists and engineers will help you apply this versatile metal to your production. Write.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. C-4392
3160 EAST 45th STREET • CLEVELAND 27, OHIO

Send more information on these Republic products for food processing.

☐ ENDURO Stainless Steel ☐ Titanium
☐ ELECTRUNITE Stainless Steel Tubing & Pipe

Name_____ Title_____

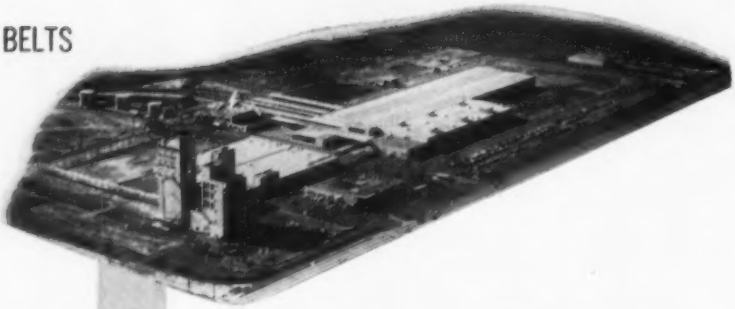
Company_____

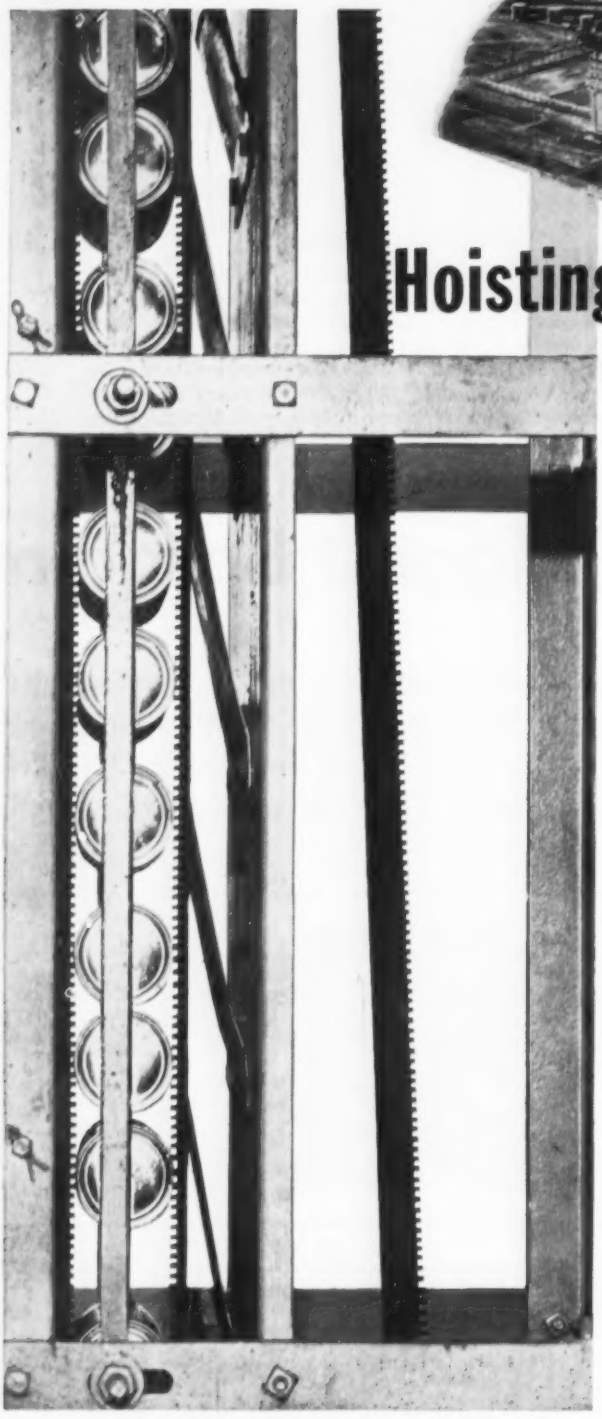
Address_____

City_____ Zone____ State_____

For more data, circle this page number on card at back →

STEEPGRADE CONVEYOR BELTS





Hoisting Millions of Beers—

straight up—with never a slip

At this giant Anheuser-Busch brewery, this pair of U. S. SteepGrade Conveyor Belts lifts 16 oz. cans of beer *at a 90-degree angle.*

"No other belt could have accomplished better performance. It's nothing short of spectacular," says the manager of the brewery.

As the 1-lb. cans come from the pasteurizer slippery and wet, they roll onto the vertical can conveyor where SteepGrade carries them straight up and onto an incline to the carton-filling machine. Cans don't slip at all, even when the conveyor is stopped.

The secret is SteepGrade's exclusive "gripper cleat" construction—a molded, integral part of the belt itself. These thousands of "gripper cleats" hold the cans firmly, yet gently. This means far less pressure, far less belt speed is required. Damage to cans and print smearing is eliminated. And the more efficient operation saves electric power, lengthens belt life.

This remarkable materials-handling solution came as a result of U. S. Rubber's Three-Way Engineering service: "U.S." belt engineers worked closely with the designer of the conveyor system and the plant engineer.

This service—plus a complete line of conveyor belting for any materials-handling problem—is obtainable at the 28 "U. S." District Sales Offices, or contact us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

Close-up of one of the vertical can conveyors. Note how evenly spaced the cans are, how slight is the pressure being exerted against the cans by the belts. This, despite the fact that when the picture was taken, *the belt had been stopped for more than a minute.*

Mechanical Goods Division

United States Rubber

DEVELOPMENTS TO WATCH

Special

FOOD ENGINEERING

Service to Executives

One irradiated food will be fed each day to 300 troops at Ft. Lee, Va., during the fall and winter. A variety of meats, fruits, and vegetables will be involved in this rigorous, large-scale taste test.

Electronic computers now are pinpointing best plant locations, pre-calculating process and control performance, handling accounting problems, forecasting sales, and establishing optimum distribution operations.

Kroger is homogenizing peanut butter ultrasonically by a simple device. Product is pumped through in-pipe fixture containing auto-vibrating stainless steel "reed."

Maintenance men have a handy new tool—a portable ultrasonic gage that measures the thickness of metal in vessel walls or pipes from one side. The battery-powered instrument is accurate to 3%.

Fluid foods now can be pressure dispensed from cans without foaming. Barbecue sauce is the first. Look for table syrups, icings, toppings, and oils to follow. One type of valve sprays product, another gives a stream.

Two large processors are experimenting with boilable polyester bags, one for baby foods, the other for corn. They apparently are looking long-range to possible substitute for tin can in retort processing.

Flowmeter control of fill of liquid foods into containers is considered possible—with accurate and sanitary free-rotor induction instrument that can be made in minute sizes.

Moisture content of dry foods like crackers can be measured continuously as product travels on a conveyor. Using a capacitance-reactance sensing element, an electronic instrument "reads" moisture to an accuracy of 0.25%.

Capillary piercing of pickles by 15,000-volt. shot before packing cuts holding time for sugar-solution absorption from 2 months to 5 days. Technique has possibilities for brining pickles, curing meat, glaceing fruits.

Automatic electric-eye sorting of wet white and pea beans at last is possible. Electronic dry bean and nut sorter does it, after a few modifications. Much labor is saved, and old busy-finger manual rejection of good beans eliminated.

Truck-loading time and labor are greatly reduced by new system of handling wire baskets of bread on pallets. Machine brings basket level with bread conveyor, loaves are put into it, then 56 baskets stacked on pallet.

Protective polyethylene coating imparts no taste or odor, is unaffected by oils and salt, and heat-seals to an airtight, moisture-proof closure.

Polyethylene coated package

"Increased sales for the whole line"

That's the opinion of G. N. Stevens, Treasurer of Empire State Nut Co., Albany, N.Y. Their peanuts and salted nuts are packaged in bags made of cellophane that features a protective coating of BAKELITE Brand Polyethylene. "We would definitely recommend these bags," he continues, "because of their clarity and durability, and the long shelf life they give the product."

Profit from this example—Many a packager has increased sales for his whole line with protective coatings of BAKELITE Brand Polyethylene. Ask your supplier for all the reasons or write Dept. ZP-63.

IT PAYS TO USE COATINGS MADE OF

BAKELITE
BRAND
POLYETHYLENE

UNION CARBIDE

BAKELITE COMPANY, *Division of Union Carbide Corporation,* 30 East 42nd Street, New York 17, N.Y.

The terms BAKELITE, UNION CARBIDE and the Trefoil Symbol are registered trade-marks of UCC.

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A Bronze yoke bushing nut
B Handy grip iron wheel
C Bronze yoke bushing
D Iron yoke cap with zerk fitting for lubricating bushing
E Steel yoke cap bolts and nuts
F TYPE 316 STAINLESS STEEL spindle
G NI-RESIST CAST IRON, TYPE 2, yoke
H Bronze eye bolt nuts
I Malleable iron gland flange
J Steel gland eye bolts
K Steel gland lug bolts and nuts
L TYPE 316 STAINLESS STEEL gland
M Teflon impregnated asbestos packing
N TYPE 316 STAINLESS STEEL bonnet bushing
O NI-RESIST CAST IRON, TYPE 2, bonnet
P Steel bonnet bolts and nuts
Q TYPE 316 STAINLESS STEEL spindle ring
R Asbestos gasket
S TYPE 316 STAINLESS STEEL wedge pin
T NI-RESIST CAST IRON, TYPE 2, through-port body
U TYPE 316 STAINLESS STEEL solid I-beam wedge
V TYPE 316 STAINLESS STEEL seat rings

Wherever valves are attacked by acids, salt and alkaline solutions, sea water, brine or other corrosive fluids, vapors or gases, "Jenkins Ni-Resist Gate Valves" are *fighting* words.

In a wide range of corrosive and erosive services common to the chemical, food, plastics, marine, petroleum, and pulp and paper industries, these valves have shown a remarkable ability to withstand corrosion and cut valve costs.

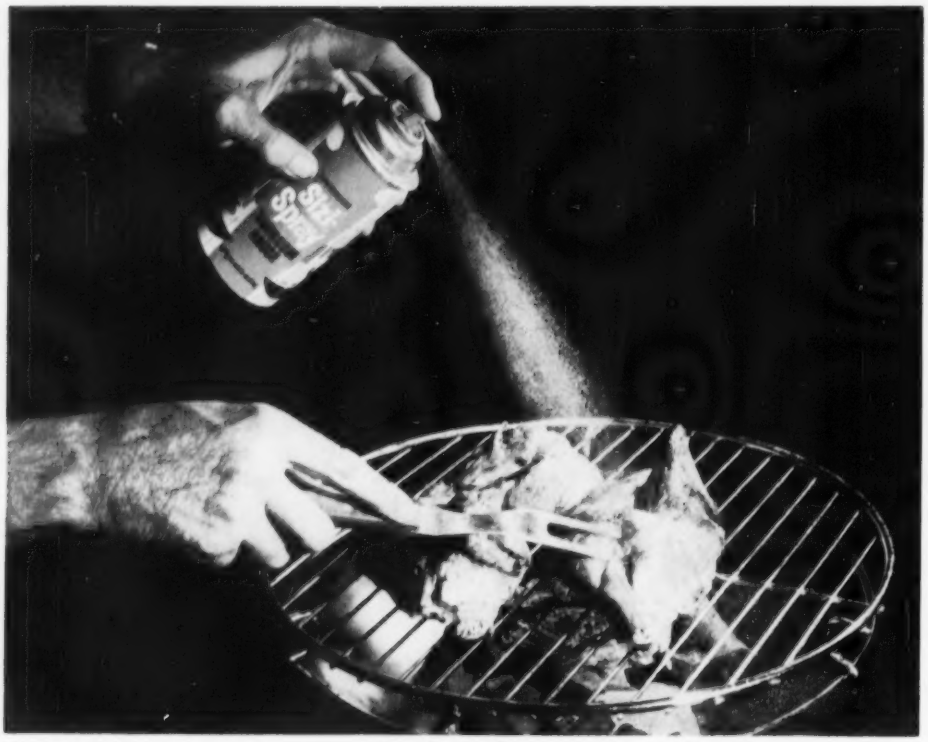
The secret of their long, trouble-free service is the combination of Ni-Resist type 2 cast iron and type 316 stainless steel trim, plus Jenkins *extra value* construction throughout. No other gate valves offer this combination for fighting corrosion.

When choosing Ni-Resist valves, let the famous Jenkins Diamond be your guide. Specify "JENKINS NI-RESIST" — for longer valve life. Write us, or ask your Jenkins Distributor for information folder No. 205. Jenkins Bros., 100 Park Avenue, New York 17.

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS
SINCE 1864
Jenkins Bros

Sold Through Leading Distributors Everywhere

Creating The Package



Heublein's new pressure-packed barbecue sauce signals . . .

Major Breakthrough

Latest valve designs and gas mixtures open the door for dispensing products in non-foamy sprays and streams

THE PRODUCT: Barbecue sauce. The package: A new aerosol that marks a major breakthrough in dispensing pressurized foods in non-foamy, non-aerated sprays or streams.

The item is being test-marketed this month by Andersen's Foods, Inc., a division of G. F. Heublein Co. And everyone concerned believes that with the right products—and barbecue sauce seems preeminently one of them—pressure packing will have a great consumer appeal.

The reasons can all be summed up in one word: Convenience. This is the main feature that pushed sales of pressurized whipping cream (and a few other toppings) to 60,000,000 units last year, and boosted non-food aerosols to an estimated 260,000,000 cans.

But the specific reasons why the barbecue sauce is expected to click with both the housewife in her kitchen and the man-of-the-house presiding over his backyard grill are as follows:

- The sauce is simply sprayed on meats, is easily controlled in amount, and spreads evenly.
- A ready-made product is more convenient than a home-mixed food.
- Basting brushes and bowls are eliminated—an improvement over previous prepared sauces.
- Dispenser can be held 6 to 8 in. away from the meat, which should cut down on seared fingers.
- The can won't break if knocked off the barbecue stand.
- Shelf-life is good. Pressurized gas excludes air, and the dispensing valve is a positive seal. Storage life for this

SPECIAL CAP creates an eye-catching shape (designer: Koodin-Lapow Assoc., N.Y.C.). Three-piece dispenser (right) utilizes standard can, special applicator, and valve assembly.

In Food Aerosols

particular product is about 9 to 12 months.

▶One of the biggest uses—and a year-around one, too—will be in the kitchen for rotisseries. The housewife simply opens the door and sprays the meat as it turns.

Heublein is now test marketing locally in Los Angeles. But if response meets expectations, the product will be spread promptly to national distribution while there is still time to catch some outdoor barbecueing in the West and South. And the company expects to follow up this initial product—a sweet-sour preparation specially formulated for spare ribs, pork, ham, and poultry—with a full line of aerosol foods.

Since the pressure packaging of whipped cream (first introduced in '47) and of non-food products has been so successful, why haven't there been other pressure-packed foods?

There are a number of reasons, most of them technical and previously unsolved.

What Were the Roadblocks?

One of the major blocks has been the belief that foods could be dispensed only in foamed or aerated form. This works fine with whipped cream, but the housewife presumably wants to have other foods in the color and texture to which she is normally accustomed. In short, she doesn't want a foamy syrup, or a frothy-pink sauce.

Another problem was finding a propellant gas that would both do the job and pass the FDA.

Liquid propellants used for non-food products—gasses such as the fluorinated hydrocarbons (Freons) that are liquefied by compression and cooling—give excellent pressure as long as the product lasts. But they are not approved for foods.

The alternatives, compressed propellants such as nitrogen and carbon dioxide that remain gaseous and meet FDA qualifications, were thought to be impractical because of a gradual pressure loss during dispensing.

There were numerous other problems, too, related to particle size of the product, viscosity, biological preservation, and design of valves and other parts of the dispenser.

Then last year, Continental Can Co. launched an intensive research program to solve the problem of non-foamy dispensing. This company discovered that with correct product formulation, proper processing during packaging, and a specially designed valve and actuator, compressed propellants could be used. Now a wide range of products can be successfully pressure-dispensed in either a liquid stream or spray.

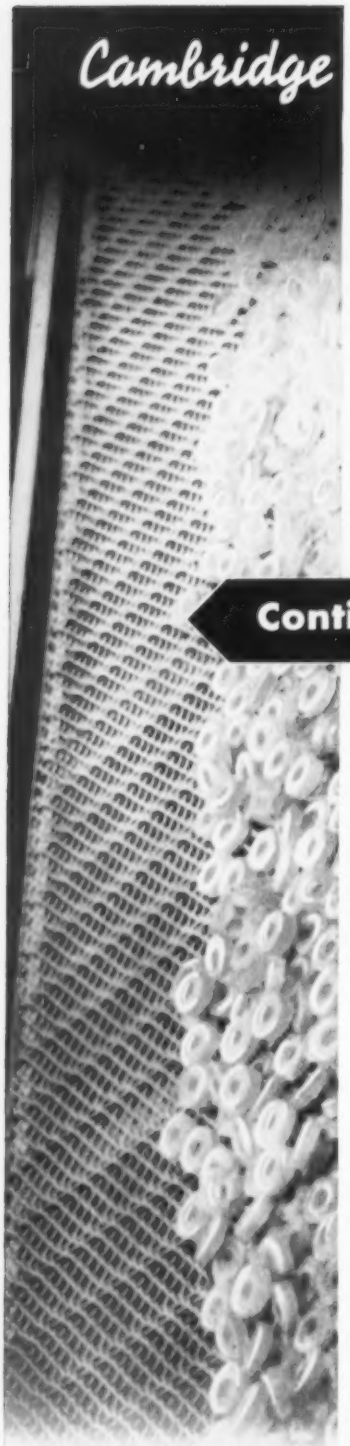
Can Design Is Big Factor

Packaging for Heublein is being done by Western Filling Corp., a Los Angeles contract packager specializing in aerosols.

The can used for the sauce is a 12-oz., 211x413 domed aerosol—a standard Continental Can container also used for hair sprays and other non-food products. The product fill is 9 fl. oz.

A metal over-cap covers the domed portion and the dispensing device when container is not in use. It's the same diameter as the can, which gives the package a streamlined, cylindrical shape on the retail shelf.

The valve assembly seats on the rim of the can. It consists of a polyethylene dip tube, a nylon valve stem, and body, set in a double-coated mounting cap (Precision Valve Corp., Yonkers, N. Y.) *Turn page*



Cambridge

Wire Mesh Belts

give you

fast, uniform, continuous processing

Steady, continuous movement of meats, vegetables, candy, fruits or breads on wire mesh conveyor belts eliminates slow batch processing, costly manual handling. Using sanitary, open mesh belts to quickly move foods through washing, cooking, baking, cooling, packaging or freezing operations also helps increase production, maintain quality, reduce damage or waste.

EXAMPLE:

Continuous Cooling

MOVING BELT carries hot candy through cooling tunnel in a steady stream. Free circulation of air through open mesh speeds cooling process.

OPEN MESH also provides free circulation of heat or cold, free drainage of washing or cooking solutions. Chips or bits of the product drop through the open mesh to maintain product uniformity.

ALL METAL BELT cannot absorb odors . . . remains unaffected by processing solutions, high or sub-zero temperatures . . . gives longer life because there are no seams, lacers or fasteners to weaken or break. Rust-proof alloys maintain sanitary requirements.

SPECIAL RAISED EDGES or surface attachments are available to hold products on belt during inclined travel.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can get faster, more economical processing by using woven wire conveyor belts. Look for his telephone number under "Belting, Mechanical" in the *Yellow Pages*. Or, write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

Department Q,
Cambridge 9,
Maryland

WIRE CLOTH | WOVEN WIRE CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Seated on the valve stem is the actuator—the part that is pressed by the user and from which the spray emits. This newly designed one-piece unit (Calmar) is made of polyethylene. It performs its chief function of breaking the product stream into a spray by means of a tiny spinner located in an expansion chamber atop the can.

In the can, gas is both dissolved in the product and free in the headspace. And it is at equilibrium. As barbecue sauce (and a small amount of gas) is dispensed, some gas leaves the product for the headspace, creating a new equilibrium pressure.

There is some loss in equilibrium pressure, of course. But the new can keeps this to a minimum so that the change in spray quality is insignificant to the user. The product residue, when the can pressure is finally gone, is about 4%.

The gas used in this application is a mixture of nitrous oxide and carbon dioxide, which meets FDA standards.

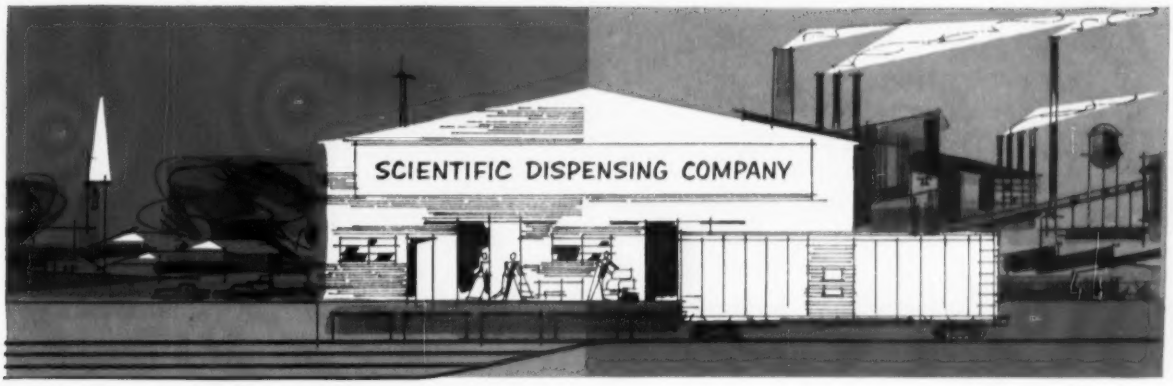
Different foods will probably require different mixtures, chiefly because gasses vary in their solubility, both in relation to each other and to the foods.

Details of Packaging Line

Since much of the secret of success with this package is in the packaging process, Western Filling isn't willing to reveal all the details at this time. However, here are the general steps:

After mixing, finishing, homoge-

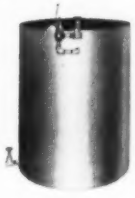
HEART of the barbecue sauce line is shown above. After washing, cans pass through a 10-spout filler (rear), then a crimper (left, center), and drop into a spin cooler (lower left). Gassing and shaking operations follow.



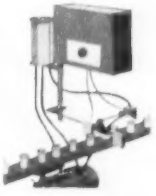
Now from one source

A complete line of dispensing equipment

Only the Scientific Dispensing Company offers you all 4 types of tested and approved dispensers. And by dealing with Scientific Dispensing, you get dependable installation and maintenance service from one source for all dispensing machines.



The Morton Model-E Brinemaker is specially designed to produce up to 800 gals. of brine per hour from readily-available high-purity salt. No space-wasting storage tank is needed, and there's no need for costly shutdowns for cleaning out sludge or impurities. (Brinemakers not available on the West Coast.)



The amazing Flocron Liquid Dispenser works automatically—remote controls permit you to "dial" the exact amount of brine, spices, chicken fat, etc., you want for your lines. Handles up to 300 units per minute. The Flocron can be operated on existing equipment without revising production lines.

The Bulk Salter Machine dispenses salt, sugar, MSG, etc., direct to can lines. Accurately serves up to 400 cans per minute—if no can is present, no seasoning is released. Machine can be filled and supervised by unskilled labor.

The Salt Tablet Depositor will automatically deposit salt tablets in as many as 700 cans a minute. Guarantees accuracy. Automatic models work on a "no can, no tablet" and a "no tablet, line stops" basis. Depositors come in a variety of special sizes . . . will place tablets in narrow mouth bottles, cans, jars.

Make the Scientific Dispensing Company your headquarters for machines that help you reduce labor costs, eliminate waste, and assure better flavor control through more accurate dispensing of seasonings and preservatives.

All these dispensing machines have been successfully used by leading canners, packers, and food processors. For more detailed information about any of these accurate dispensing machines, write or wire:

SCIENTIFIC DISPENSING COMPANY

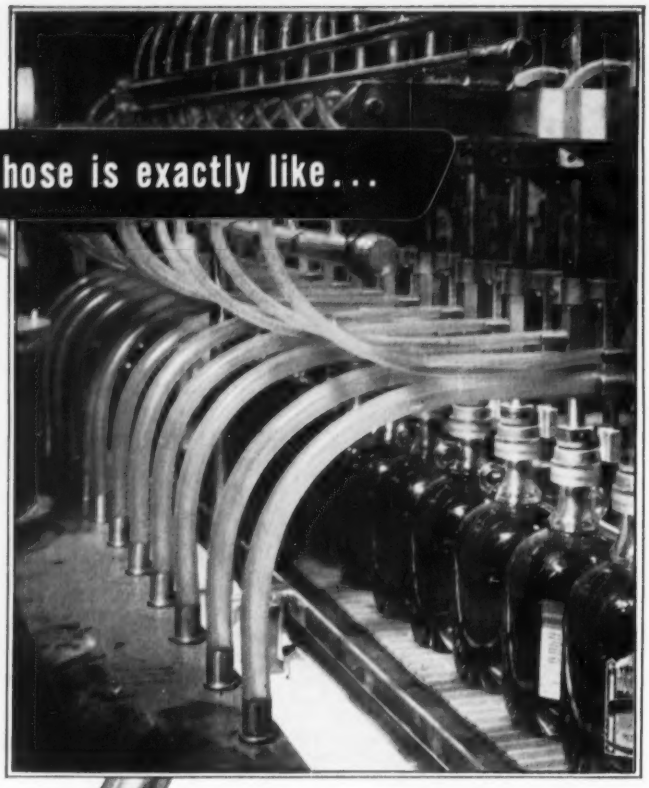
DIVISION OF

MORTON SALT COMPANY

Dept. FE-9, 120 So. La Salle Street, Chicago 3, Illinois

For more data, circle this page number on card at back →

No other food and beverage hose is exactly like...



TYGON B44-3

Write today for your copy of Bulletin T-97, Tygon Flexible Plastic Tubing.

Where else could you find a piping medium for liquid foods and beverages that combines all these features:–

Chemically inert—non-toxic, completely resistant to all food acids and commercial cleaning agents. Tygon B44-3 tubing "pipes" the most flavor sensitive foods and beverages with never a trace of flavor or odor taint.

Flexibility—permits installation in long continuous runs without joints or couplings. Adapts to any layout. The polished bore plus the absence of sharp turns allows rapid flow rates without clogging.

Glass-like clarity—permits visual inspection of flow at any point.

Easy cleaning—Tygon lines may be disassembled, cleaned or steam flushed and reassembled in minutes.

Fifty-five bore sizes—1/16" i.d. through 3" i.d. to accommodate virtually any plant requirement. Simple clamp fittings make for fast easy coupling or uncoupling. No other tubing is exactly like Tygon B44-3. The complete story—fully detailed, graphically illustrated, is yours for the asking.

Plastics and Synthetics Division

U. S. STONEWARE
AKRON 9, OHIO

nizing, and pre-heating—the product goes to a 10-spout filler (Hope).

Next station is the crimper, which fastens the valve body to the can. Then cans pass through a spinner cooler that lowers them to proper gassing temperature. On the present line there are two 12-head gassing machines (Alpha) that inject gas into the cans and simultaneously shake them to help dissolve the proper amount of gas in the product.

Defective cans are eliminated prior to casing by passing the containers through a hot-water tank and checking for escaping bubbles.

The two gassers have a combined capacity of 90 cans per min. And since the line up to this point can handle 225 per min. plant production can be jumped by simply adding more gassers and shakers.

Outlook for Other Foods

One of the most likely candidates for the next aerosol product is cake frosting. Other products now under consideration: Fruit concentrates for drinks, toppings, salad oils, chocolate and table syrups, and meat tenderizers.

The importance of introducing the right foods to establish aerosol foods with the public is emphasized by Robert C. Webster, a former Continental Can man who now manages Western Filling's food division and also heads up the Food Aerosol Liaison Committee of the Chemical Specialties Mfg. Assn.

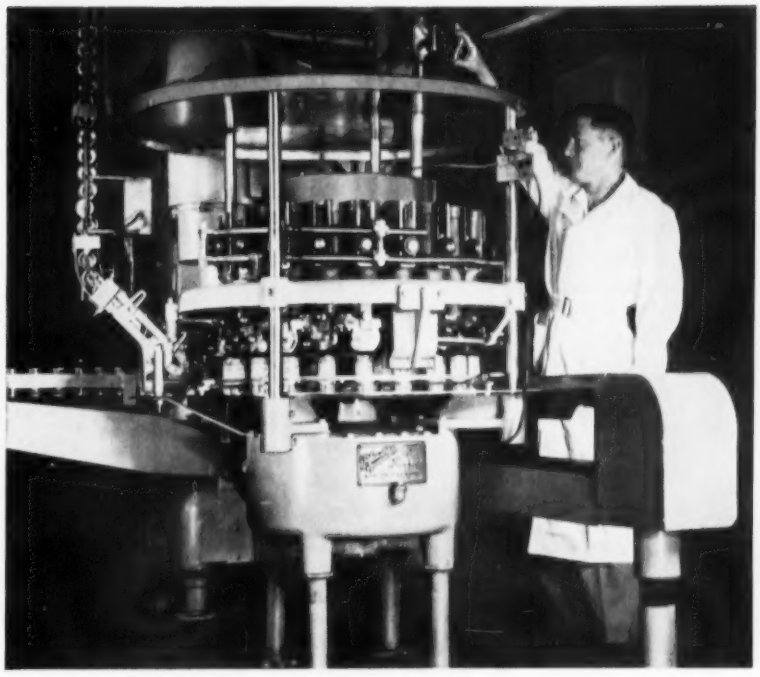
"The wrong foods—products for which pressurized packaging offers no special advantage, or perhaps even disadvantages—could kill the whole deal", he declares.

Webster considers barbecue sauce one of the real naturals. Table syrup is another, especially for restaurants. Here, pressure dispensing offers less mess, less waste.

Every new product, however, will present its own complex problems of proper formulation, spoilage prevention, and correct relationship between the product and gasses, dispensing device, and method of filling.

Because of this complexity and the initial expense of equipment, it's likely that most pressurized food packaging will be done by contract packagers for some years to come.

But the potential appears to be high. In fact, spokesmen for Continental Can Co. estimate that within a year pressurized food packaging will zoom to more than double the number of containers now used in non-food applications.



Do you sacrifice accuracy for faster filling?

Look then to Pfaudler and the rotary piston fillers with which there is no sacrifice of accuracy or speed when you fill foods and other viscous and semi-solid products.

With Pfaudler rotary piston fillers you can choose filler speeds from 40 cans a minute to as high as 1000 cans a minute, and still get the extra features and accuracy that weren't considered possible a few years back.

FEATURES LIKE THESE:

Accuracy to 1/10 ounce. Rated to fill within specified tolerances—usually within ± 1/10 ounce. *No container-no fill* control on every machine.

Sanitary, easy to clean. One man cleans within 30 minutes, even on largest machines. Slide one-piece valves out. Lift simple ring-free pistons out. That's all.

Low maintenance costs. Just four primary wearing parts—piston rollers, valve rollers, valve trip cams and wear pads on valve locks...each part durable, low cost and easy to replace.

There is a range of five Pfaudler piston fillers to meet your viscous and semi-solid liquid needs.

Check the coupon for more information on these fillers plus other integrated process equipment from Pfaudler.

THE PFAUDLER CO., Dept. FE-97, Rochester 3, N.Y.

Please send bulletin on ☐ **Rotary Piston Fillers**
and this other Food Processing Equipment by Pfaudler:

☐ Titan Superjector
☐ Heat Exchangers
☐ Tanks—Mixing and Storage
☐ Conical Dryer-Blenders
☐ Evaporators—Film Type

Name _____ Title _____

Company _____

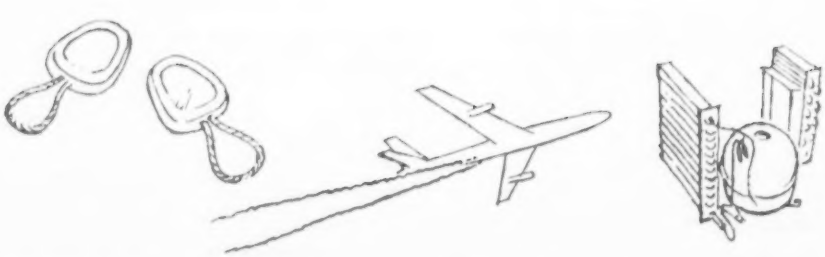
Address _____

City _____ Zone _____ State _____

For more data, circle this page number on card at back →

Report No. 5 of a series

I was a slave to weather until I found



← For more data, circle this page number on card at back

Kathabar® systems maintain spaces at 80 F and 55% RH, or lower, for processing, storage, and testing!

You can pick the best production weather you've ever had, and reproduce it every day of the year. You can set the exact storage temperatures and humidities which are ideal for your product. And in your testing lab, you can imitate any climate on earth.

All of this you can do economically with a Kathabar-engineered air conditioning system. In many applications, cooling can be accomplished with available water (e.g., a Kathabar system can reduce 72 F dew point air to 46 F dew point with 85 F cooling tower water). Refrigeration, when needed, is free to handle only sensible cooling with minimum tonnage and higher suction temperatures—without frost or duplicate coils. No overcooling or reheating necessary.

let's look at cases

This sampling of Kathabar installations will show you how effective and versatile a Kathabar system can be.

9 climates for candy

Candy's sold seasonally, but manufacturing economy demands uniform production throughout the year. A Chicago company uses Kathabar systems to store different types of candy in 9 separate zones. Humidities range from 12 to 50% RH; temperatures, 50 to 85 F.

zoned for profits

Another candy manufacturer spots individual Kathabar units and cooling units to fit the varied requirements of drying, chilling, polishing, coating, bottoming, packaging, storage, and comfort. One example of Kathabar-earned profits: polishing time cut in half.

ethical competition

In the high-volume, low-margin pharmaceutical industry, companies always seek new ways to reduce costs and improve quality control. One of the biggest companies achieves both with Kathabar systems in over 100 air conditioning zones. Outside weather can not interrupt processes. As a bonus, Kathabar systems deliver sterile air.

getting jets off the ground

The chemicals in solid rocket fuels are extremely hygroscopic, and must be dried before use. Kathabar systems protect their physical properties and insure accurate ballistic results. Process areas are maintained at precise conditions, even when hosed down frequently.

relieving printers' headaches

Kathabar systems keep printing papers from getting too wet or too dry; improve ink distribution and drying; eliminate the variables in plate-making. Printers earn new profits with more press time, fewer schedule upsets.

fast compressor assembly

Water vapor in a refrigerator compressor could cause obvious troubles. A Kathabar system enabled a large manufacturer to switch from batch to continuous drying—and cut production time, handling, and manpower.

who uses Kathabar systems

Kathabar systems make profits out of air for these industries:

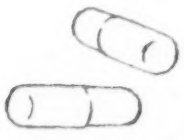
Atomic Energy	Machining
Breweries	Matches
Cake Mix	Marine
Candy	Meat
Cellophane	Offices
Cellulose	Ordnance
Cereals	Paper
Chemicals	Pharmaceuticals
Coffee	Plastics
Comfort	Printing
Compressors	Rockets
Cookies	Rubber
Electronics	Shellac
Explosives	Sugar
Film	Sanitaryware
Foundries	Testing
Gelatin	Textiles
Glass	Transformers
Glue	Transistors
Gum	Vacuum Tubes
Hospitals	Varnish
Hotels	Waterworks
Lacquer	Wire
Lenses	Yeast

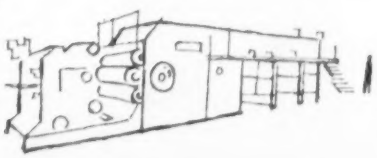
how they use Kathabar systems

Many of these industries use Kathabar systems to maintain spaces at 80 F and 55% RH or lower. Others use them to (1) obtain continuous air at sub-freezing dry bulb and dew points; (2) eliminate condensation; (3) deliver sterile air at specified dry bulb and dew point; and (4) improve drying processes.

send description of your problem

Air Conditioning and Drying Division
SURFACE COMBUSTION CORPORATION
2382 Dorr Street Toledo, Ohio





Kathabar systems by Surface

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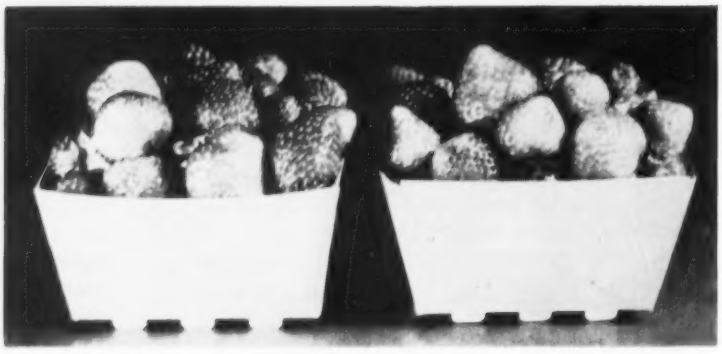
NEW PACKAGES & PRODUCTS



Paper Hallock Solves Berry Crisis

When bulging warehouses and low field prices forced West Coast strawberry growers to place an extra large percentage of their 1957 crop on the market, the result was a packaging crisis.

With only six days to go, the growers found that there weren't enough hallocks for the berries—and the boxes could not be produced fast enough. The answer lay with Container Corp. of America.

In less than a week the packager designed, produced, and delivered a new die-cut waxed-board hallock. The berries were packaged and shipped, and the growers could breathe freely.

The new hallock is cold wax coated on both sides. It is well ventilated to protect against mold. The legs keep the basket raised above the master crate, reducing spoilage and crushing. Machinery for forming the cartons is manufactured by Kliklok (Designed in four days to meet the 1957 emergency).

The hallock is priced competitively with standard designs.

Circle 28A on Reader Service Card

For "Tangy" Breakfasts

An instant orange-flavored breakfast beverage called Tang will be introduced in selected markets this month. Made by General Foods Corp.'s Post division, the powder is mixed with cold water.

Tang is said to contain more vitamin C and A than equivalent amounts of fresh or frozen orange juice. Package is 7- and 17-oz. jars.

Crustless Pies Show Product

"Chunk-style" chicken, turkey, and beef pies are now processed by Blue Star Foods, Inc., Council Bluffs, Iowa. The pies feature a single large, solid piece of meat, instead of many small flakes.

In an effort to spur impulse buying, as well as explain their label, the processors distribute sample pies with the top crust removed to show the contents. These are packed in a rectangular styrene box to affort maximum visibility. The samples are displayed in the freezer cabinet with the regular pies.

More Bread in Foil

Bright foil wrappers for bread are gaining in popularity as users announce sales increases up to 600%. Among bakers now using Reynolds Aluminum Co. foil wrappers are:

- Rice's Bakery, Baltimore, for its Weekender enriched bread.
- Bamby Bakeries, Minneapolis, for its Hollywood brand.
- Virginia Holsum Bakeries, Staunton, Va., for its king-size Holsum loaf.
- Bell Bakeries, New York City, for its Miss Nineteen bread.
- Capital Bakers, Inc., Harrisburg, Pa., for its Pennsylvania Dutch Loaf.

In addition to an attractive appearance, the foil adds days to the shelf life of the bread, a benefit to both consumer and retailer.

Circle 28B on Reader Service Card

New Heat-Sealable Saran

Newest product of Printon Corp., New York City, is Saran-O-Seal, a newly developed Saran wrap which can be heat-sealed on conventional packaging equipment.

The new material is ideal for packaging ready-mixed dough, potato chips, cheese, dried fruits, and similar products. It provides an air-tight, rugged package, at low cost.

Circle 28C on Reader Service Card

Frozen Meals Go National

Now in national distribution are three frozen prepared meals processed by Campbell Soup Co. under the Swanson label. Called Main Courses, the dinners have been test-marketed for the past eight months.

The meals are: Beef with gravy and parsley potatoes; Fried chicken and mashed potatoes; and Meat loaf with tomato sauce and green beans.

Instant Malted Milk

Marking the first major change in Horlick's Corp., Racine, Wis., in 84 years is the processor's new instanted malted milk. Boasting a high protein content, the chocolate-flavored product is now being tested in selected markets.

Dentyne has a reason...

Half the fun in gum is flavor, and gum must always be factory fresh. So Dentyne chooses a special Riegel protective paper...one that will not fracture at tightly sealed folds...and that is sure to preserve delicate flavor and exact moisture content. It's pleasure insurance for Dentyne and for American Chicle's other fine products...Grape, Clove, Blackjack and Beemans. When you buy Riegel packaging papers, you too will get:

Product protection *always*, plus...

Paper tailored to run at high speed on automatic machines.

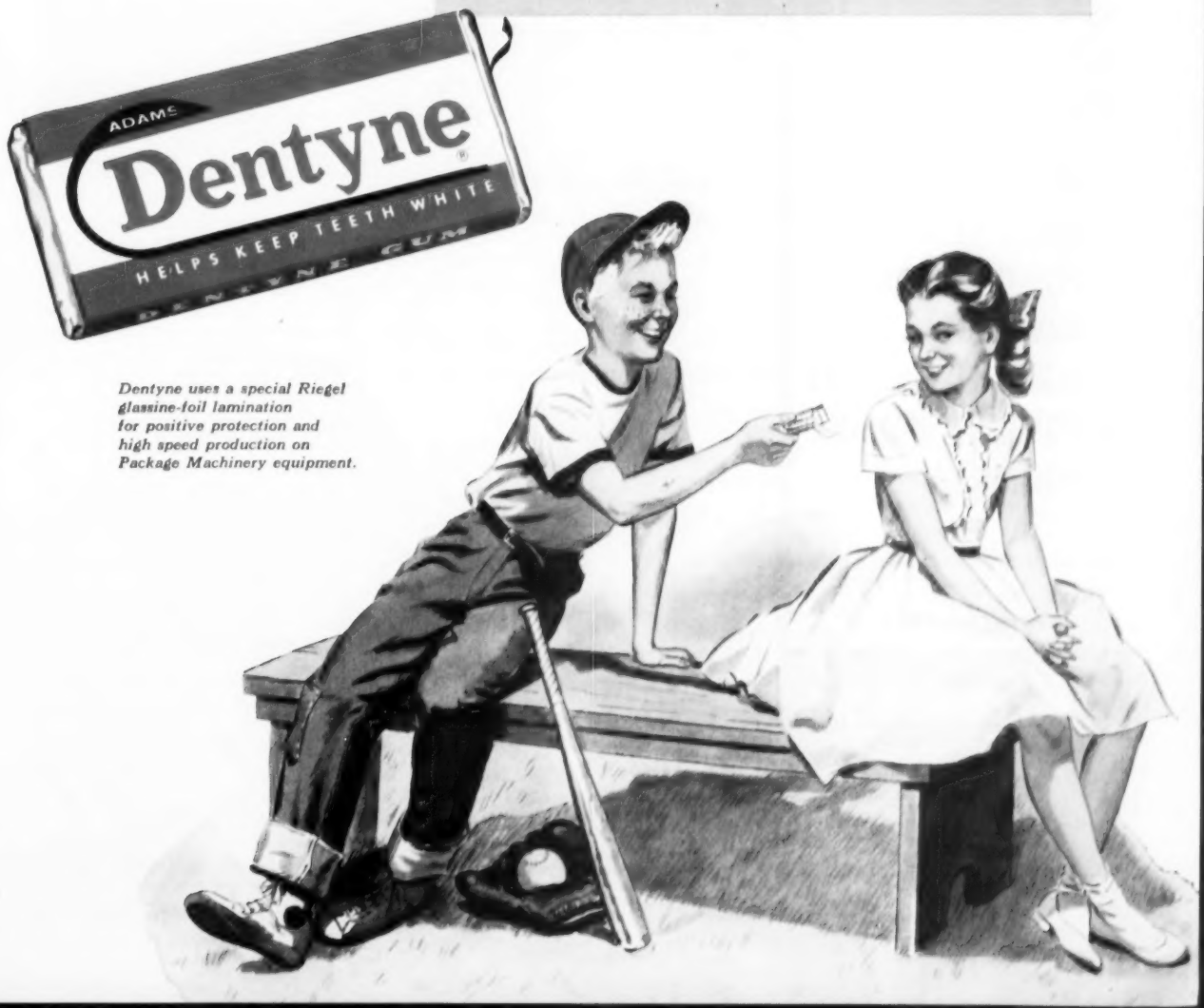
Paper made to your own specifications...plain, laminated, waxed, poly-coated, printed.

Paper that is made right, that will run right, that is priced right.

Hundreds of today's best-sellers benefit from Riegel's uniformly effective system of product protection. You can, too.
Write Riegel Paper Corporation, 260 Madison Avenue, New York 16.

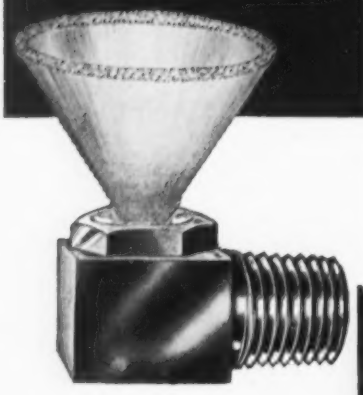
Riegel

PROTECTIVE PACKAGING MATERIALS



Dentyne uses a special Riegel glassine-foil lamination for positive protection and high speed production on Package Machinery equipment.

LESS CLOGGING WITH Monarch



Any impurities small enough to pass through the orifice of this Fig. 629 nozzle will never clog the single large internal feed hole.

Monarch offers a full line of efficient, dependable, advanced design nozzles to . . .

- WAX FRUITS
- RINSE VEGETABLES
- POWDER MILK
- DRY EGGS
- WASH FILTER CAKE
- HUMIDIFY BANANA ROOMS

Remember . . .
Make Monarch NOZZLES standard equipment for all direct-pressure spraying.

Send for Catalogs 6A and 6C

Monarch
MFG. WORKS, INC.
2517 E. ONTARIO ST.
PHILADELPHIA 34, PA.

Packages & Products

Here's General Foods New Gourmet Food Line

(For management's story behind the line see page 69)

GOURMET BISCUITS & COOKIES

Cocktail Biscuit Assortment, England
Flemish Dessert Biscuits, Belgium
Flemish Choc. Biscuits, Belgium
*Bornholm Biscuits, Denmark
Canape Cuplets, Belgium

GOURMET PRESERVES

Choice Strawberry, U. S.
Seedless Red Raspberry, U. S.
English Black Currant, England
Swedish Lingonberry, Sweden
Wild Blueberry, Sweden
Spiced Black Cherry, U. S.
Seville Orange Marmalade, England

GOURMET SOUPS

French Lobster Bisque, France
Vichyssoise, U. S.
Green Turtle Soup-Madeira, West Germany
Clear Onion Consomme-Sherry, U. S.
Swedish Mushroom Bisque, Sweden
Potage St. Germain, U. S.
Rich Oxtail, West Germany

GOURMET ENTREE SAUCES

*Sauce Provencale, England
Sauce Bigarrade, France
Sauce Chasseur, France
Sauce Espagnole, France
Sauce aux Fines Herbes, France
Sauce Bearnaise, West Germany
*Sauce Bolognaise, Switzerland

GOURMET & HORS d'OEUVRES SNACKS

*†Chili Toasted Coconut, U. S.
*Plantain Chips, Caribbean
*Okaki Cocktail Bits, Japan
*Viking Brochettes, Sweden
Marinated Artichoke Shells, U. S.
Danish Cocktail Sausages, Denmark
*Spiced Swedish Meatballs, Sweden
Scand. Fish Soufflettes, Sweden
*Numaki Spread, U. S.
*Dill Marinated Mushrooms, Sweden
*Shrimp in Dill Sauce, Sweden
*Bockling Pate, Sweden

GOURMET ENTREES

Copenhagen Ham, Denmark
*Rock Cornish Game Hen, U. S.

GOURMET DESSERTS & SAUCES

Crepes Suzette, U. S.
†Chocolate Sauce Royale, U. S.
*Cherries Jubilee, U. S.

GOURMET COFFEES & TEAS

†Breakfast Coffee, U. S.
*†Cafe Diable Mix, U. S.
†Peak Season Assam Tea, U. S.
†Subtle Tea, U. S.

OTHER GOURMET SPECIALTIES

Hearts of Palm, Brazil
Champagne Mustard, France
*†Seasoned Wheat Pilaf, U. S.
*†Chicken Stock Base, U. S.
*†Beef Stock Base, U. S.
Smorgasord Pickles, Sweden
Cherry Pickles, U. S.
Almond Pickles, U. S.

*New in United States. †Packed by General Foods

Wild Rice Pancake Mix

Mille Lacs Maple Products Corp. has introduced a wild rice pancake mix under it's Hiawatha label. Milk is added to the 1-lb. package to make 48 pancakes with an unusual flavor.

Ingredients are stone ground northern hard wheat flour, wild rice flour, calcium phosphate, soda, and salt.

Plastic Bag for Lettuce

A new polyethylene bag for lettuce has been introduced by Dobeckmun Co., Cleveland. The package differs from others on the market in size, opening and closing features, positioning of perforation, and film used.

The bags are 11x8¼ in. with a 1¾ in. bottom gusset. The dimensions are reported to be more suitable for round head lettuce than square bags. The bag opens at the 11 in. side, allowing faster, easier "catcher's mitt" loading, and a possible saving in labor costs.

Perforations along the other 11 in. side are spaced to fall around the head, insuring proper ventilation.

The polyethylene developed by Dobeckmun for the bag has deadfolding characteristics that allow dealers to use the "spin-shut" method of closure.

Circle 30A on Reader Service Card

Electrons Smoke Dried Beef

An electronically-smoked variation of the popular sliced dried beef is being produced by Armour & Co. Currently distributed only in the Chicago area, the product is called Armour Star Sliced Smoked Beef.

It is made from trimmed, smoked beef ham insides. These are chopped, spiced, cured, cooked, and thin sliced

New Gaylord-designed corrugated box for 140-lb. fuel injection unit packs fast, trims costs, reduces tare.

CORRUGATED HANDLES THE HEAVY JOBS

Gaylord Boxes

Are you paying more than you should for your packaging? Heavyweight jobs formerly requiring costlier materials are now taken in stride by corrugated boxes. Packaging like this calls for versatile materials, ingenious engineering. Gaylord has done it—time after time.

You can profit from the savings that heavy-duty corrugated boxes can deliver. Call your nearby Gaylord packaging engineer.

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

DIVISION OF CROWN ZELLERBACH CORPORATION

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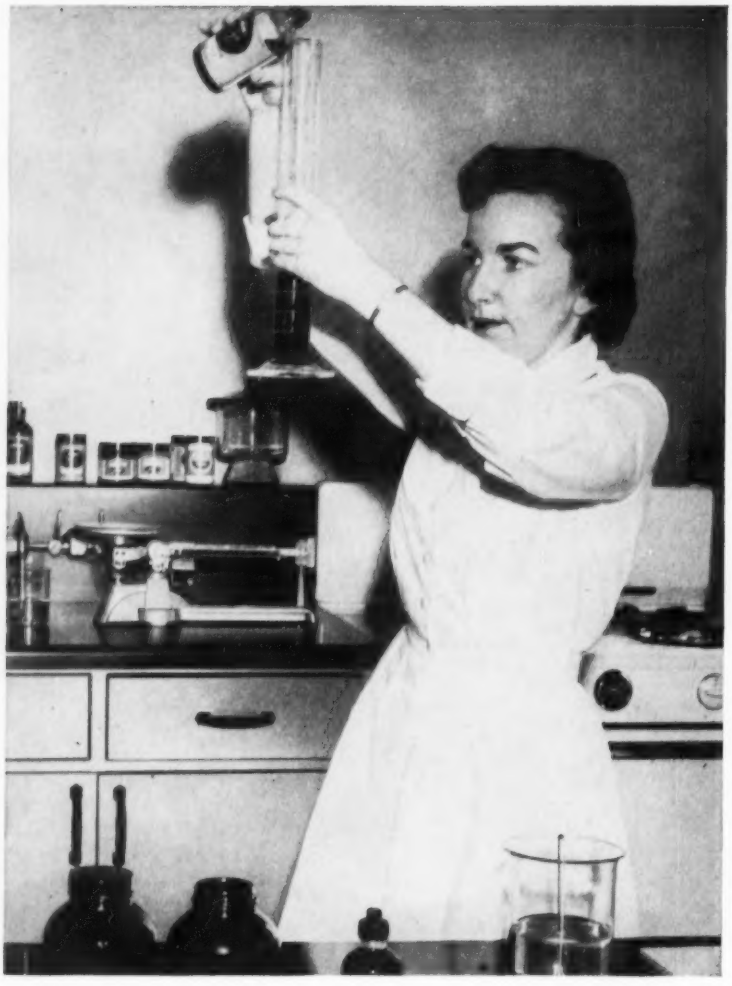
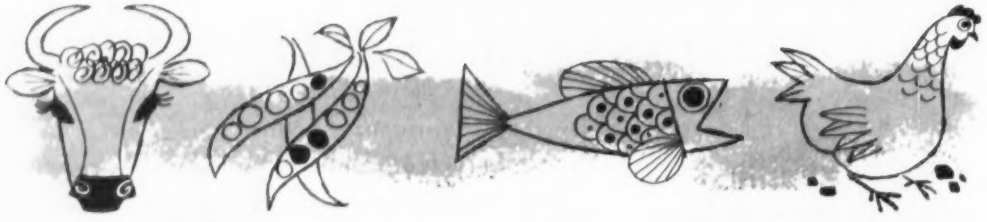
new ways to improve your product and profits





Animal, vegetable, fish or fowl—if your forte is food, Huron HVP (Hydrolyzed Vegetable Proteins) can help you enhance the quality and broaden the market for your products. This, of course, means extra sales and profits for you. In our modern, well-equipped Technical Service Laboratory, we will be happy to work with you to determine the proper use levels for your individual products.

The new booklet, *"Huron HVP," will give you a wealth of information on specific applications of HVP in all phases of food processing. For your free copy, write, wire or phone Huron Milling Division, Hercules Powder Company, Wilmington 99, Delaware.*

HVP HURON MILLING DIVISION

Virginia Cellulose Department **HERCULES POWDER COMPANY** *Wilmington 99, Delaware*

SALES OFFICES: 380 MADISON AVENUE, NEW YORK 17, N. Y. • 332 SOUTH MICHIGAN AVENUE, CHICAGO 4, ILL. • 120 MONTGOMERY STREET, SAN FRANCISCO 4, CALIF.

← For more data, circle this page number on card at back

to produce the ready-to-eat product. Flavor is reported to be milder than conventional sliced dried beef.

Product is packed in a 4-oz. transparent vacuum wrapper.

Treacle Turns to Tubes

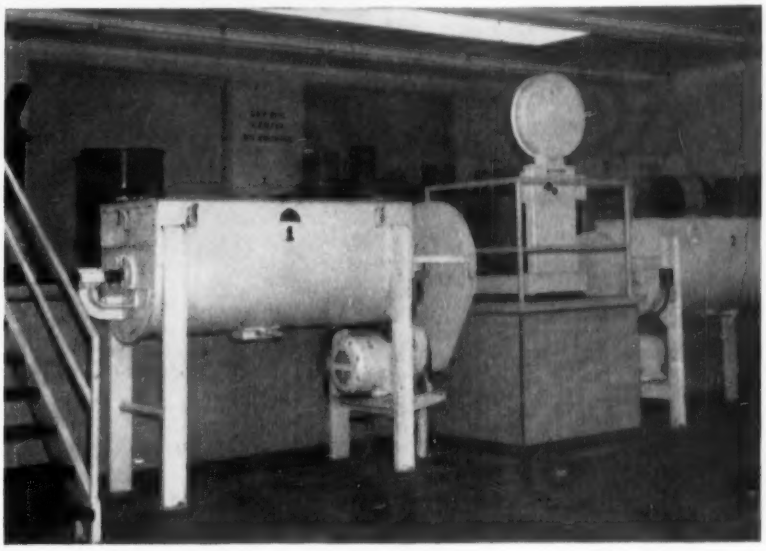
Faced with the problem of perfecting an attractive and efficient container for its Golden Syrup, a partially inverted refiners syrup, John Walker & Co., Ltd., turned to collapsible metal tubes.

The result has been climbing sales. The sticky syrup is readily controlled during dispensing, sparing the housewife the problem of sticky hands or spoons. The attractive red and gold design of the front panel is backed with a colorful tartan design.

TWIN-PACK of two bottles of Adler Food Co.'s Chef Adler Dressing offers the consumer a second bottle for only a penny more than the unit price. The trim and attractive sleeve combines the bottles in a high impulse appeal package.

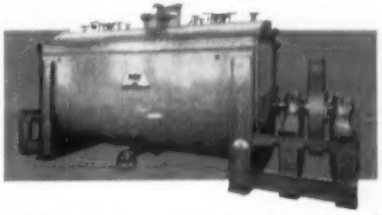
DAY mixes
in the best companies

Fearn Foods Inc. is one of thousands of old friends. They've used DAY Ribbon Blenders for years in their Franklin Park, Illinois, plant.



When the decision on what make of blenders to buy for their new modern Los Angeles plant came up, they just ordered three more DAY blenders. The reason — simply that DAY blenders have always given dependable trouble-free service. They operate smoothly, rapidly and efficiently. Their many features include outboard bearings that provide sturdy support for a solid alloy steel shaft. Stuffing boxes of sanitary seals for protecting bearings, prevent product contamination. They have a geared head motor, roller chain drive, galvanized or stainless tank, choice of agitators. Heating or cooling jackets optional. There is a complete line of DAY ribbon blenders available in capacities of 10 to 465 gal.

On the right is a DAY mixer from the Jumbo line. These rugged brutes are built for extra heavy loads. Capacities 600 to 3850 gal. Complete lab facilities available for testing your product.



Join the many companies now enjoying the production benefits of DAY blenders and mixers. Write today for Bulletin 800.

The **J. H. DAY** *Co.*

Division of The Cleveland Automatic Machine Co.
SERVING THE PROCESS INDUSTRY SINCE 1887

4924 BEECH ST., CINCINNATI 12, OHIO

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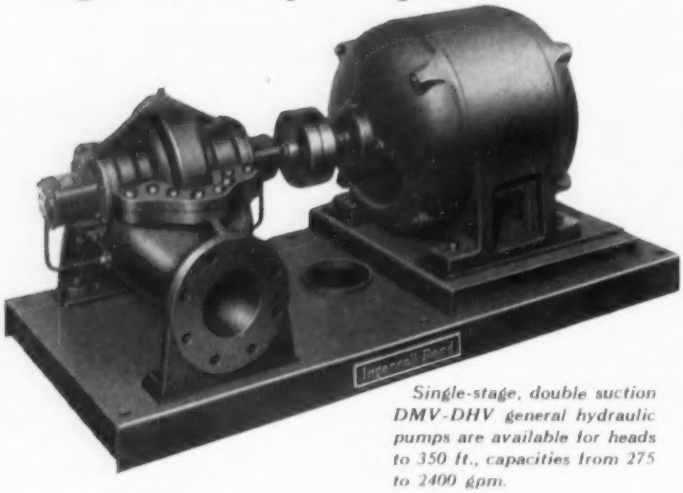
ENDS MAINTENANCE

in general pump service



Single-stage, double suction DMV-DHV general hydraulic pumps are available for heads to 350 ft., capacities from 275 to 2400 gpm.

Double shaft seals and sealed ball bearings—standard equipment on **DMV— DHV** *pumps do away with stuffing box attention and bearing lubrication*

Now, with the DMV-DHV pump, you no longer have any stuffing box worries. There's no repacking! No annoying pump shaft leaks! The Double Mechanical Shaft Seals used are completely self-adjusting. They don't require attentic n throughout their entire service life.

Moreover, greasing or oiling of pump bearings is done away with. Modern Cartridge-Type Ball Bearings are employed—with the lubricant permanently sealed in. Here's another advanced feature that makes the DMV-DHV design the simplest, most maintenance-free pump ever developed by Ingersoll-Rand for general hydraulic service.

Greater Compactness is obtained with this modern construction using mechanical shaft seals and sealed bearings.

See your nearest Ingersoll-Rand representative for further information.

Ingersoll-Rand

10-290

Cameron Pump Division
11 Broadway, New York 4, N. Y.

PUMPS · CONDENSERS · TURBO-BLOWERS · COMPRESSORS · ROCK DRILLS
GAS & DIESEL ENGINES · AIR & ELECTRIC TOOLS

Packages & Products

Family Size Ketchup Bottle

For 75 years housewives have been buying ketchup in the conventional 14-oz. bottle. Now H. J. Heinz Co. offers her a giant 20-oz. family size bottle.

National distribution has begun on the new bottle. Heinz officers report that the new bottle, (now entering national distribution) was brought about by the trend toward bulk buying of food products and an increased use of ketchup as a cooking ingredient.

The processor will continue to pack ketchup in the standard size.

Rugged Liner for Caps

Packaging foods containing oils or acids in jars has always been a problem because of the destructive effect of the ingredients on the ordinary cap liner. B. F. Goodrich Chemical Co. reports that it now has the solution: a cap liner made of Hycar nitrile rubber.

The new liners are tough and smooth. Caps are easier to open, though the seal is quite secure. The rings resists the attack of food acids and oils and are completely odor-free.

Circle 34A on Reader Service Card

Slenderella Enters Food Field

General Baking Co., New York City, is the first baker to receive a franchise to market Slenderella Special Formula Bread. Detroit and Toledo markets have been selected as the sites for introduction of the

Here's a **BASIC CONTAINER**

so good it gives new "sell" to your product!

NEW "SELF-TRACKING" TEAR STRIP ▶

HERMETIC SEAL

EASY TO OPEN

RECLOSABLE LID

FULL OPENING

BROAD LABEL AREA

BEAUTIFUL LITHOGRAPHY

PRODUCT PROTECTION

Its many sales-making features offer proved consumer appeal!

Canco invented this well-known can for the vacuum-packing of coffee. Now it's also used to package candy, cookies, powdered milk, peanuts, medicinal tablets, cocktail snacks and other items.

Perhaps *your* product could benefit from this can's many special features. Consider them:

It is airtight; can be vacuum-packed, gas-packed, or used without special treatment. It packs and stacks readily, is a snap to price-mark, is strong and durable, has a reclosable lid.

Its new "self-tracking" tear strip winds smoothly, never "spirals," makes opening much easier. Serving or measuring is easy, too, because of the can's full opening.

The broad shape of this container allows a big, eye-catching label. What's more, you'll be amazed at the variety and quality of lithography Canco offers —including sparkling metallic effects.

Your Canco representative will gladly show you samples and tell you more about this adaptable container.

CANCO **AMERICAN CAN COMPANY**

NEW YORK • CHICAGO • SAN FRANCISCO

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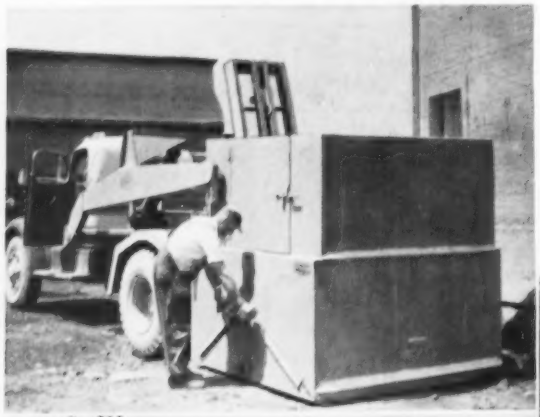
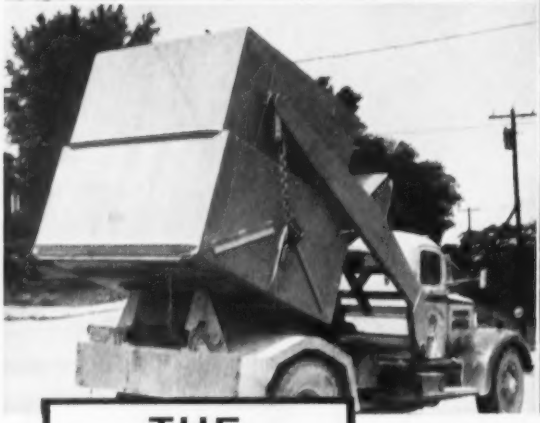
AMONG THE THOUSANDS OF USERS...





Scores of Dempster-Dumpster Detachable Containers are each picked-up, hauled and dumped (as pictured here), one-after-another by one truck-mounted Dempster-Dumpster with only one man, the driver, at the Stokely-Van Camp Newport, Tenn., plant.

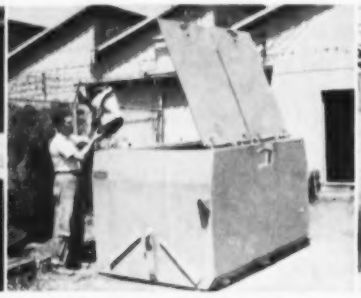
THE DEMPSTER DUMPSTER® SYSTEM

STOKELY-VAN CAMP, INC. also handles its bulk material collections with this low cost method

STOKELY-VAN CAMP, INC. is one of the recent companies to install the low cost, sanitary Dempster-Dumpster System of materials handling. Photos of the Dempster-Dumpster equipment in operation at the Newport, Tenn., plant give you an idea of the many efficient collection jobs handled by this method — and each big detachable container, in the design and size to meet each material requirement, is picked up, hauled and emptied by the same truck-mounted Dempster-Dumpster. In addition to its promise to produce an appreciable reduction in collection and handling cost, and sanitation advantage, Stokely-Van Camp officials were attracted to this method because of the fire-resistant detachable containers, which reduce fire hazards. You, too, can expect tremendous savings . . . remarkable results in plant-wide cleanliness and sanitation . . . and reduction in fire hazards with the Dempster-Dumpster System! Write us today for complete information! *Manufactured by Dempster Brothers, Inc.*

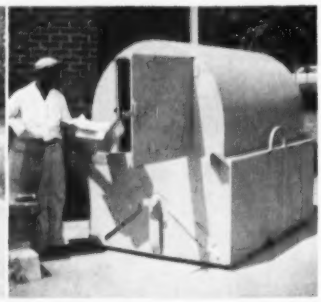
Here is Universal Container being loaded from ground level. Note it is also located at dock for loading through top lids' opening.

Below is Dempster-Dumpster Container located at machine shop.



This container is one of two placed for receiving vegetable wastes from washer bins.

This Apartment Type Container is located behind office building for collecting waste papers, boxes, etc.



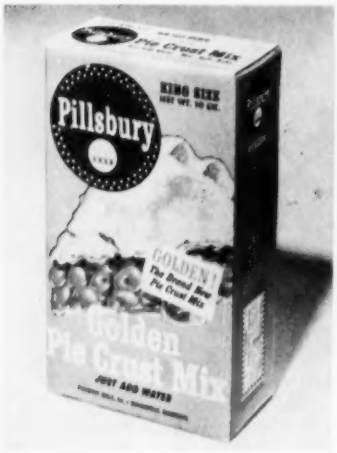
DEMPSTER BROTHERS, 787 Shea Bldg., Knoxville 17, Tennessee

bread, though national distribution is already planned.

The product is a white, thin-sliced bread, reported to contain twice as much protein, vitamins, and minerals as ordinary bread. It is not a reducing bread, but is suitable for calorie-restricted diets.

Gluten is added to increase protein content and strengthen cell structure. It has a milk to flour ration of 8 to 100.

A Slenderella jelly is slated to make its national debut next month.



Improved Pie Crust Mix

Latest Pillsbury Mills bake mix to reach consumer markets is Golden Pie Crust Mix. Like the regular mix which it replaces, the new product is formulated by chill blending of flour and shortening.

The 10-oz. package is ample for two 9-in. pie shells.

New Product Shorts

French-Fried Potato Sticks in cans is newest product of H. W. Lay and Co., Chamblee, Ga.

Switch from Bottles to Cans has been announced by Chicago Dietetic Supply House, makers of low calorie, non-carbonated Quench.

Vegetarian Hamburgers, made with vegetables instead of meat is a new product of Worthington Foods, Inc., Worthington, O.

Orange-Apricot Beverage is being test-marketed in the New York area by California Packing Corp., under Del Monte label.

HAMILTON
STAINLESS STEEL KETTLES

JUST think! Over three quarters of a century building fine cooking and mixing kettles for industry. These quality units, engineered and designed by the finest craftsmen, insure higher efficiency, labor-saving and cost-saving operation. There's no substitute for the best—"Hamilton." When it comes to mixing, the agitators, the drives are designed for longer life and these rugged sanitary units have proved themselves in operation. The Steam-Jacketed Kettles are fast-cooking, easy-cleaning, precision-built.

If it's the best you want—then you want "Hamilton," the foremost designers and producers of the finest kettles to mix and cook. There's a "Hamilton" to suit your specifications so why settle for anything but the best, a "Hamilton" Stainless Steel Kettle.

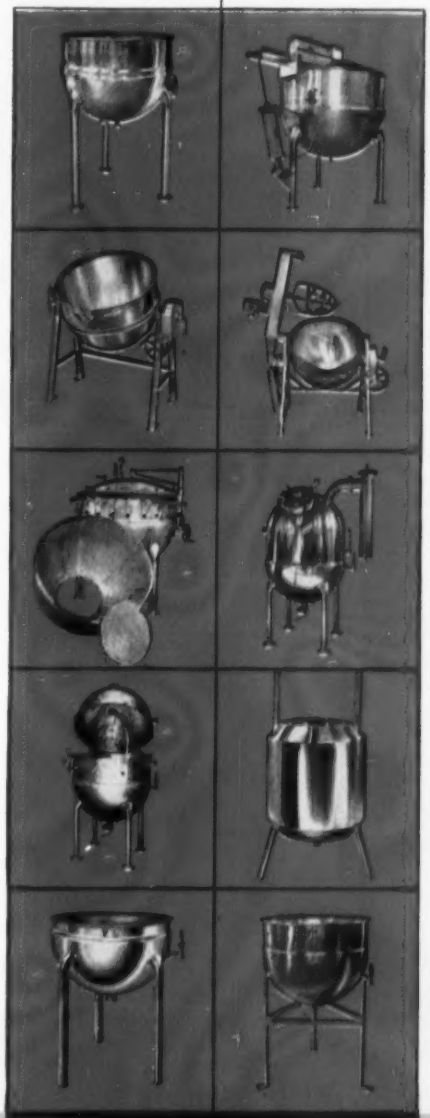
STYLE SA
Streamlined design, balloon gasket. Extra large diameter provides greater heating surface, efficient cooking. Sizes range from 15 to 500 gallon. A.S.M.E. Code constructed for steam working pressures of 40, 90 and 125 pounds.

STYLE CW
Designed to process large batches up to 150 gallons. Positive worm gear and handwheel give complete control of large capacity loads while tilting. Large diameter kettle gives fast, even cooking. Sizes from 30 to 150 gallons.

STYLE PC
Stainless steel pressure cooking kettle, designed especially for meat and poultry processing. Balloon jacket gives increased heating capacity. Built for 90 p.s.i. in jacket and 15 p.s.i. in kettle. Has quick opening latches. Top is lifted by eccentric lever. Sizes 30 to 250 gallons.

STYLE VT
For small batches this unit has no equal. Vacuum cooker with tilting top, easy loading. Sizes from 30 to 150 gallons. Sanitary design throughout. Jacketed for 90 p.s.i. steam working pressure.

STYLE SB
Shallow type kettle with balloon jacket. Streamlined for complete sanitation. A.S.M.E. Code constructed for working pressures of 40, 90, and 125 pounds. Sizes range from 15 to 350 gallons. Larger size kettle can be furnished to meet specifications.



STYLE SA MIX COOKER
Standard SA Mix Cooker has either single motion or double motion agitator with or without hydraulic lift. With hydraulic lift agitator lifts easily and smoothly out of cooker. Sizes range from 30 to 500 gallons.

STYLE CW MIX COOKER
Large diameter gives fast even cooking. Hydraulic Lift tilts agitator smoothly and easily out of tilting kettle. Available for 40, 90, 120 pounds steam working pressure.

STYLE HV
A vacuum cooker for large capacities from 150 to 500 gallons. A hinged manhole is provided for access to the inside. Available with a mixer — circulator can be installed to increase heat transfer and agitation.

CIRCULATOR
Stainless steel steam immersion heating unit can be installed in any kettle regardless of size or shape. Gives extra heating surface at the center of kettle. Creates thermal agitation. Speeds up cooking 45%.

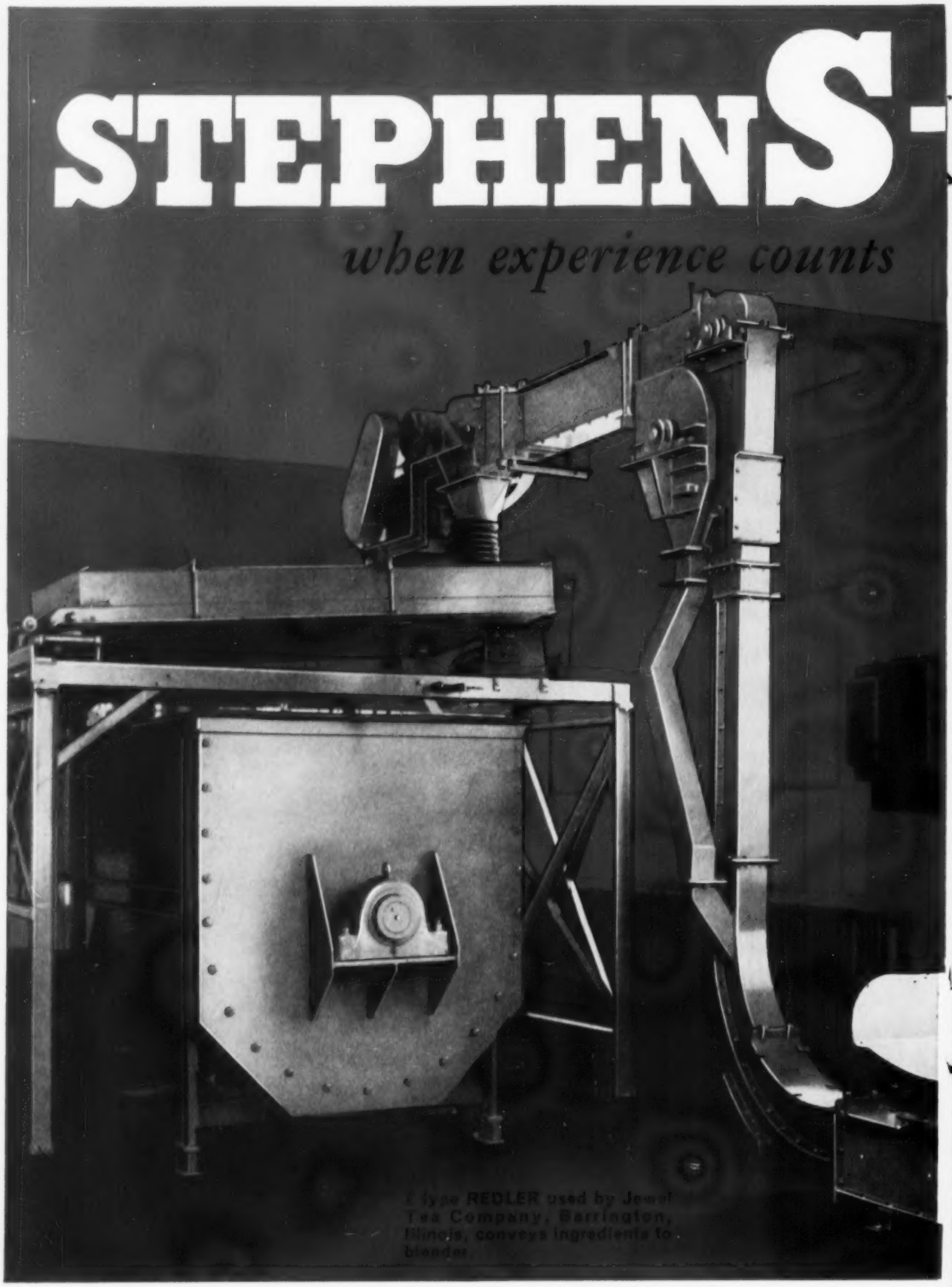
STYLE A
General purpose steam jacketed kettle used in processing food, drugs, and chemicals. Full ½ jacketed. Sizes range from 15 to 500 gallons. Also available in Type 316 stainless steel or nickel. Larger sizes to meet specifications.

KETTLE SPECIALISTS HAMILTON SINCE 1876

DIVISION OF BRIGHTON CORP.... 820 STATE AVENUE ... CINCINNATI 4, OHIO

STEPHENS-

when experience counts



T type REDLER used by Jewel Tea Company, Barrington, Illinois, conveys ingredients to blender.

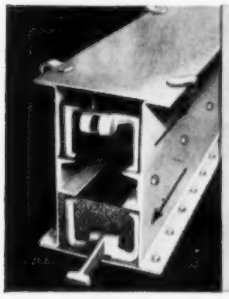
-ADAMSON

in your bulk food conveying system

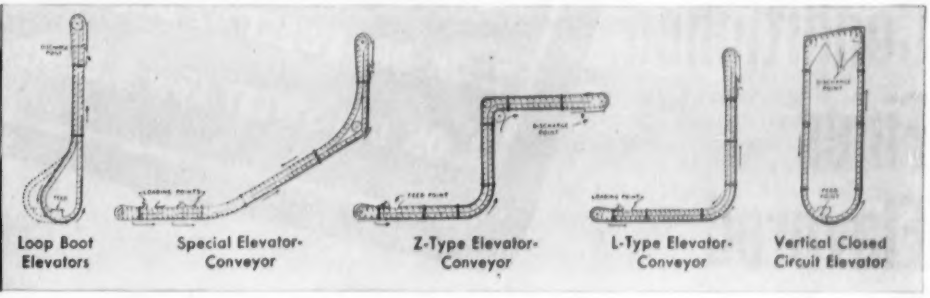
To meet ever growing demands at home and abroad, the food industry looks more and more to automation on the production line. The trend continues toward more specialized food preparation, more involved handling problems. Holding production costs in line calls for food handling techniques of the highest order.

For over fifty years, STEPHENS-ADAMSON engineers have worked closely with food processors in providing the finest bulk handling systems in the world. These systems have been molded from a widest selection of S-A manufactured conveyor products—products that embody the finest features of economy and dependability and, at the same time, guarantee by their design the highest standards of food protection and sanitation.

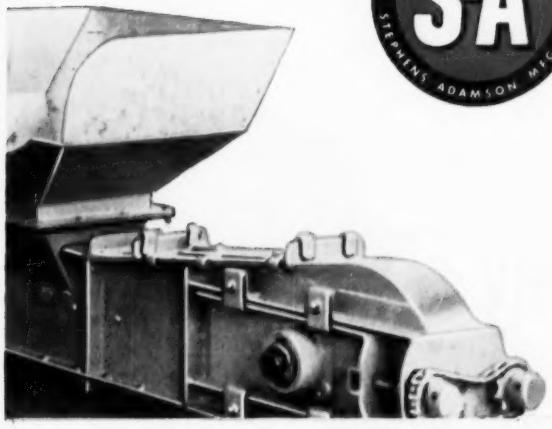
If you are thinking about a new conveying system, or if you are wondering just a little about the adequacy of your present one, why not consult the S-A engineer in your area? He may be able to help you turn some of your production costs into profit dollars.



CROSS SECTION VIEW OF REDLER CONVEYOR MADE ONLY BY S-A



While Stephens-Adamson builds practically all conveyor types, the REDLER conveyor-elevator is an S-A product exclusively. There are well over 20,000 in use today, many of them in the food processing industry. Shown here are a few of the arrangements possible with this tremendously versatile conveyor type.



SINCE 1901 S-A STEPHENS ADAMSON MFG CO

STEPHENS-ADAMSON MFG. CO.

6 RIDGEWAY AVENUE, AURORA, ILLINOIS
LOS ANGELES, CALIFORNIA
BELLEVILLE, ONTARIO

S-A manufactures a wide range of material handling products in three complete plants in U. S. and Canada.

- Belt Conveyors
- Belt, Pan & Plate Feeders
- Ship Loading Boom Conveyors
- Stacking Conveyors
- Storage & Reclaiming Systems
- "Natural Frequency" Vibrating Conveyors
- REDLER Conveyor-Elevators
- ZIPPER Conveyor-Elevators
- Conveyor Belt Cleaners
- Headshaft Holdbacks
- Grizzlies & Screens
- Centrifugal Pilers
- Bin Gates & Tunnel Gates
- Car Pullers & Spotters
- Bucket Elevators
- Skip Hoists
- SEALMASTER Ball Bearing Units

• *Write for a bulletin on any of the above products.*

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NOW 3 SUPERIOR CORN SYRUP SOLIDS

carry the OK BRAND of QUALITY

1. OK DRI-SWEET 42 D.E.—(Granulated)
2. OK DRI-SWEET 42 D.E.—(Powdered)
3. OK DRI-SWEET Low D.E.—(Powdered)

for Better Conditioned, Finer Flavored Foods

OK DRI-SWEET 42 D.E. (GRANULATED) is especially suitable for seasoning comminuted luncheon meats, smoked, cured and preserved meats. It is colorless, reduces watering off, cuts shrinkage, improves texture, is a better binding agent and can be used in greater quantity for maximum fill.

But, whether you produce prepared meat products, dry food mixes, frozen foods, ice creams, soup mixes . . . if you want finer flavor, better texture, controlled moisture, increased solids, and improved shelf life . . . *if you want quality at no extra cost* . . . you can get it with the OK BRAND DRI-SWEET Corn Syrup Solids. In fact, *only* OK DRI-SWEET Corn Syrup Solids provide a combination of *so many advantages in a single conditioner-seasoner.*

Write today for detailed data on how OK DRI-SWEET Corn Syrup Solids can help you improve your production, or phone for a Hubinger Food Products Technician. You'll find him and the Hubinger Customer Research Service OK too.

The Hubinger Company

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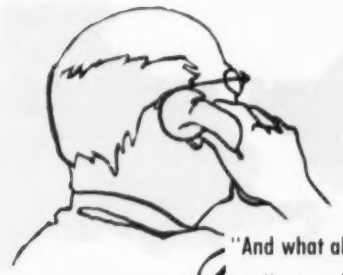
HUBINGER — QUALITY PRODUCTS — 76 YEARS — From CORN

NEW YORK • CHICAGO • LOS ANGELES • BOSTON • CHARLOTTE • PHILADELPHIA



Ole Sage Episode

"And what about grievances?" queried Ole . . . "They're up, too," came back Tom plaintively. "Alarmingly so — and with too few cases being settled at first-line level."

Workers Sour, Output Down—What's Cure?

IVAN C. MILLER
"Food Engineering"

"HOW SOON can you get over here, Ole?" came the urgent call over the phone. "I'm in trouble here at the plant—up to my neck—and I sure need your help!"

Ole Sage quickly recognized the frantic voice on the wire. It was Tom Watson, Personnel Director of Y&G Specialty Foods Co.

"But Tom—what's the rush?" he queried. "You know," he went on with a laugh, "my kind of consulting service hardly ever gets an emergency call. Anyhow, give me a brief outline of your trouble. Then I'll hop over."

"It's like this, Ole: We're losing more and more production time. Our output is sinking despite our bigger payrolls. Mr. Pushard, our President, is roaring like a lion—says 'Things have GOT to improve, or else!' Of course, line management is upset. And in the end it all falls on my shoulders. So—can you come right away? For a fee, of course. I'm authorized to pay for your help."

"You have my sympathy," Ole assured him. "But let's have a few facts over the phone before anything else. How about worker absences?"

"They're increasing," admitted Tom. "Also more and more of our employees are late starting work, and then knock off early."

"And now, how about accidents?" probed Ole.

"They're rising, also," lamented Tom, "in spite of all our safety measures."

"One more question, Tom. How about grievances?"

"They're up, too—in fact, alarmingly so," came back Tom plaintively. "And what's worse, too few cases are being settled at the first-line level. Now—when can you get here?"

"First things first, Tom," counseled Ole. "Initially, I want you to check your records over there for some information I need. Got a pencil?"

"Ready. Fire away," said Tom.

"O.K., then" said Ole. "First, let me have a record–at least for one year, but preferably two or three–indicating which workers have been absent more than once a year. I'd like the number and length of absences for each. Also, give me the same information relative to those who've arrived late. And the same data, too, for those who've had accidents, those visiting first-aid, and finally those who've submitted grievances."

Ole hesitated a moment to give Tom a chance to get it all down, then added: "One more thing, Tom. Ask each of your foremen and supervisors for a list of trouble makers, if any, in their departments."

Later that day, after receiving and scanning Tom's reports, Ole phoned back. And to Tom's surprise, and also disappointment, he didn't comment on the reports. Instead, he asked about the company's president, P. J. Pushard.

"As a president, he's fairly new," explained Tom. "He's a hard worker himself and a real driver. He came up through sales–most recently was Sales Manager. He was always a hustler, and most of his sales records are still unbroken. Then, four years ago, he was made President."

"All right," commented Ole. "Now it's time to arrange a get-together at your place. And as for those we'll need to have at this meeting, No. 1 is P. J. Pushard, and then. . ."

"Not a chance on Pushard!" interrupted Tom. "He won't come, and that's that. Just let me relate my own experience–it'll give you some idea of the man. He's the kind who doesn't want to be bothered with, well, trivial details, or have his time wasted.

"You see, Ole, when he had me on the carpet recently to discuss the loss of production and present conditions, I finally told him that I considered the situation was critical and

---

UP THE HARD WAY came Ole, our principal character in this special series of "cases" fictionized to pinpoint boss-worker problems in the food plant.

Ole began as a laborer, proved himself "a good worker" who "used his head"—thus won the respect of both workers and bosses. He later rose to foreman, then superintendent. And finally he was management's choice as "a natural" to head Industrial Relations, a job he carried out with unusual success until his retirement.

—Actually, his was a very short retirement. Because his old company, and others, too, quickly were calling to him for counsel—as related in these episodes.—*The Editor.*

". . . Less than ⅓ of your employees are responsible for 90% of your absences."

called for outside aid. But then he said to me the same thing he's said to others over here–

"'Mr. Watson, I believe in passing on responsibility, and with it the authority to act. Having done that, I don't want to be bothered with anything except a report of successful results.

"'If you can't clear up this mess fast yourself, then get someone who can. But get it done! Production must come up right away!'

"So you see, Ole, he won't come. And I don't consider it wise even to ask him."

Ole, however, was adamant. "No president–no meeting," he stated flatly. Then he continued: "As for *my* calling him—well, he'd almost certainly consider me an outside meddler. No, it's up to you, Tom. And I assure you that he's the key man here for getting a successful end-result."

Tom remained silent. Then Ole added: "By the way, is he the kind of man who reacts to a challenge?"

"Matter of fact, he does," came back Tom. "Particularly in the field of sales, which is his baby. Yes, that's always the best approach to him. All right, I'll try to think up a challenge angle, though I really haven't much hope."

"He'll line up," encouraged Ole. "I take it for granted. And when he does, please get your Plant Manager and one or more of your most important department superintendents to sit in with us, too. Also anyone else you wish to have from your own department."

Tom did manage to impress P. J. Pushard that there was a pressing significance in his sparing a short time for their meeting. And on the scheduled day, all were on hand in Y&G's conference room a few minutes before the hour–that is, all except P. J. Pushard, who arrived *exactly* on time.

Pushard immediately introduced himself to Ole, shook hands, then announced: "Every one of you is a busy man—or should be. At least my time is valuable. Watson, here, has promised that this meeting will be a real value to me, and to all the rest of you. It had better be. Now let's get going and put this behind us fast. You take over, Sage."

"To start with," spoke out Ole, "there are facts about your company which call for spotlighting here–certain details which you probably haven't sufficiently considered."

Ole opened out a folder, then continued: "I have here some vital statistics concerning your employees–figures that tell a rather regrettable story. Even so, they're figures that can point the way for correcting the situation–which you'll agree has got deplorable, otherwise you wouldn't have called me in."

Pushard squirmed a bit. It was obvious that he didn't relish use of the word "deplorable" in connection with his company. Nevertheless, he withheld comment, and Ole went on–

"During the last three years, there have been increases in both absences and tardiness–as shown by these records. The absences may be accounted for, in part, at least, by the decided rise in number of accidents, and also the average number of days lost per injury.

"Furthermore, the number of visits per month to the first-aid room has zoomed, even though your plant is as free of accident hazards as it's practical to make it. And lastly, there's strong evidence of labor unrest in your plant. Not only have grievances risen, but they've become increasingly more difficult and costly to settle. And your supervising group reports 'worker belligerence,' and also the presence of 'agitators'."

Pushard couldn't contain himself. "We're wasting time," he fumed. "This is information we all know–'in general, at least'–for output per man has certainly dropped. But what we really need to know is the cause, or causes. And how to correct the condition–at once!"

Unruffled by Pushard's outburst, Ole pressed on: "The fact that less than a third of your employees are responsible for almost 90% of the time losses and the disturbances indicates you have a large proportion of 'marginal' workers. A great number of this type are emotionally unstable, and some are probably mentally disturbed to the extent they may be considered psychoneurotic or psychiatric."

"Are you sure?" questioned Pushard, who now was quite obviously more interested than he was at first. "Can figures–employee records, that is–be depended on to mirror the facts to that extent?"

"Results of many studies," Ole assured him, "confirm the fact that problem workers will have approximately three times as many severe accidents as normal workers. Also, the time they'll be away on sick leave will be two to three times that of the normal employees. And furthermore, the problem worker will visit first aid or the dispensary three to four times as often as the others.

"Yes," Ole went on, "the figures are factual, revealing, and pretty dependable. But," he offered as encouragement, "your organization is not unique in this respect. This same type of worker is found in almost every food manufacturing organization, often in lesser proportion but sometimes even to a greater extent."

"Seems to me, that's something to stop and think about," contributed Plant Manager Jerry Mastead. "If a third of our machines were that inefficient, compared to the rest, we'd just junk them and buy new ones. From the profit standpoint we'd have no choice."

"Does that mean we'll have to get rid of all our weak sisters in order to bring production back to where it once was?" asked General Superintendent Bill Pacer. "Anyhow, it doesn't make sense to me, because our trouble isn't totally with the new employees. For some reason that I can't understand, even some of the formerly reliable employees–workers who've been with us a long time–have recently gone sour."

"No," assured Ole, "the remedy isn't quite as stringent as firing 'em all. Actually, there's a logical program to follow. And it can be charted with a fair degree of assurance of final results. But that's only if you, Mr. Pushard–you who are the company's President–make the program and the results possible."

"This I *do* want to hear, believe me!" Pushard stated emphatically. "And if what you say is true, then this thing's a real *challenge*, and I want to know all about it!

"Sorry, though. I have to leave right now—have an appointment. But," he added as he rose, "let's meet again tomorrow, at this very same time."

(To be continued next month)

New book tells full story of stainless pipe and tubing

If you use stainless or high alloy pipe or tubing, this new illustrated handbook was written for you. It's 48 pages big – packed with informative data that you'll refer to again and again.

The table of contents is too long to list here, but it includes, for example, analysis and conversion tables, corrosion characteristics, weights, alloy properties, bending, joining and installation hints.

We can't guarantee how long the supply will last. To be sure of getting your free copy, why not clip and mail the coupon now?

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They look like twins... but one is synchronous

Louis Allis "SYNCRO-*SPEDE*"* offers... for the first time... a synchronous motor in the same frame sizes as a standard induction motor

New from Louis Allis — *the most compact and efficient synchronous induction motor on the market* . . . the revolutionary "Syncro-Spede." It's the *only* synchronous motor built in standard NEMA frames for comparable ratings in any enclosure.

The space-saving "Syncro-Spede" has no external excitation, wound rotating fields, collector rings or brushes—offers simplified control and low-cost operation. And it's virtually maintenance-free.

In performance, "Syncro-Spede" delivers and maintains exact synchronous speed within its rated capacity, regardless of load variations or voltage dips. When "Syncro-Spede" motors of several different ratings are powered by a single adjustable-frequency source, their acceleration, running speed, and deceleration can be synchronized.

"Syncro-Spede" is the low-cost answer to such demanding synchronous applications as *precise adjustable-frequency multi-motor systems* . . . high-frequency generator drives and constant-speed conveyor drives . . . precision timing and metering devices . . . recording instrument drives . . . any system requiring constant speeds from no-load to full-load.

"Syncro-Spede" sizes range up to 100 hp. For information and expert application engineering assistance, contact your nearby Louis Allis District Office or write directly to The Louis Allis Company, 442 East Stewart Street, Milwaukee 1, Wisconsin.

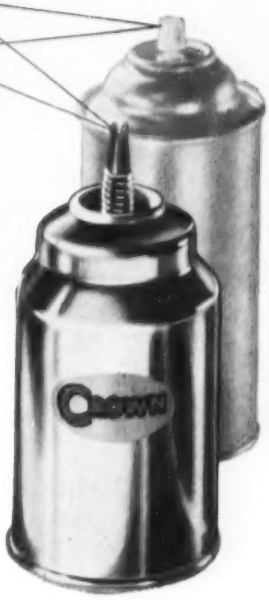
*"Syncro-Spede" is a trademark of the Louis Allis Co.

LOUIS ALLIS

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

... FOR SUNDAE TREAT

... OR MONDAY TOAST



whatever you **can** ...

can with CROWN Spra-tainers

For pressurized dessert toppings or brand new ideas in food packaging, such as butter spray . . . seasonings . . . tasty spreads, *can* with CROWN Spra-tainers—to give your product line a real sales spurt.

Spra-tainers offer the filler and marketer more advantages. Metal guarantees no breakage . . . seamless construction provides high-styling . . . full wrap-around lithography lends beauty and high-fashion. Yet, if style is not a factor in your product merchandising, CROWN offers the conventional fabricated Spra-tainer.

Write for your copy of CROWN's new 3rd edition—"GUIDE TO PRESSURE PACKAGING." Crown Cork & Seal Company, Inc., Can Division, 9322 Ashton Road, Philadelphia 36, Pa.

whatever you can . . . call on CROWN

CROWN CORK & SEAL COMPANY, INC.

MANUFACTURERS OF CLOSURES, CONTAINERS AND MACHINERY

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WASHDOWN HOSE

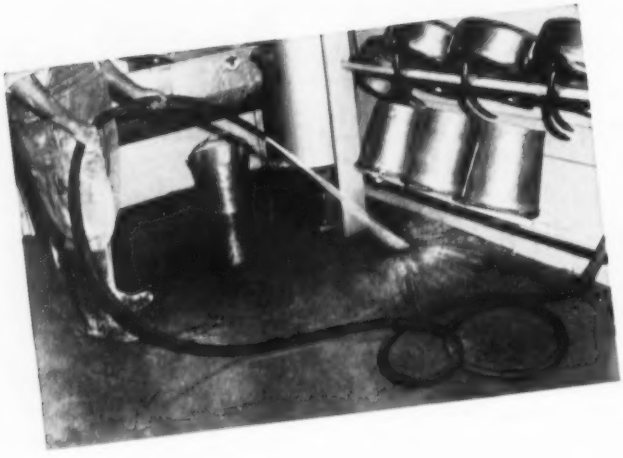
Washdown hose that's never a washout

FOR HOT WATER OR LOW-PRESSURE STEAM

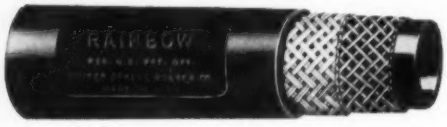
For washing, cleaning and sterilizing equipment, this specially compounded **U. S. RAINBOW® CREAMERY HOSE (STYLE P-255)** has a white, strong and flexible cover, resistant to destructive effects of grease and lactic acid. Nozzle can be built integral to prevent chipping of fragile linings in tanks and sterilizers.

U. S. PACKER'S WASH-UP (STYLE P-7093) is very flexible, but very rugged. Four-ply carcass duck assures easy handling, perfect balance. Cover of black neoprene resists destructive action of animal fats, oils, and abrasion.

FOR COLD OR WARM WATER



U. S. PEERLESS® WATER HOSE (STYLE P-365) has a tube of extruded natural rubber to provide a smooth waterway. Carcass of braided rayon for longer life in high-pressure service. Highest grade brown cover is specially compounded for resilience, resistance to abrasion and other abuse. Particularly good for fruit and vegetable processing plants.



This attractively priced hose, **U. S. RAINBOW WATER HOSE (STYLE P-340)**, has a carcass of exceptional strength and flexibility, thanks to two braids of high-twist cabled rayon. Tough rubber cover resists abrasion from dragging or scuffing. Seamless tube of special rubber stock.

"U. S." Hose is available at any of the 28 "U.S." District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

← For more data, circle this page number on card at back

TEAR OUT AND FILE

PRACTICAL IDEAS

Easy in and . . .

Easy out as . . .

Roller-Rack Storage Speeds Order Picking

Selecting orders from floor piles, pallets, and shelves involves many wasted steps, plus the need for a confusing maze of aisles. This system could not handle the load at Sugardale Provision Co., Canton, Ohio, a large meat packing and frozen food distributor.

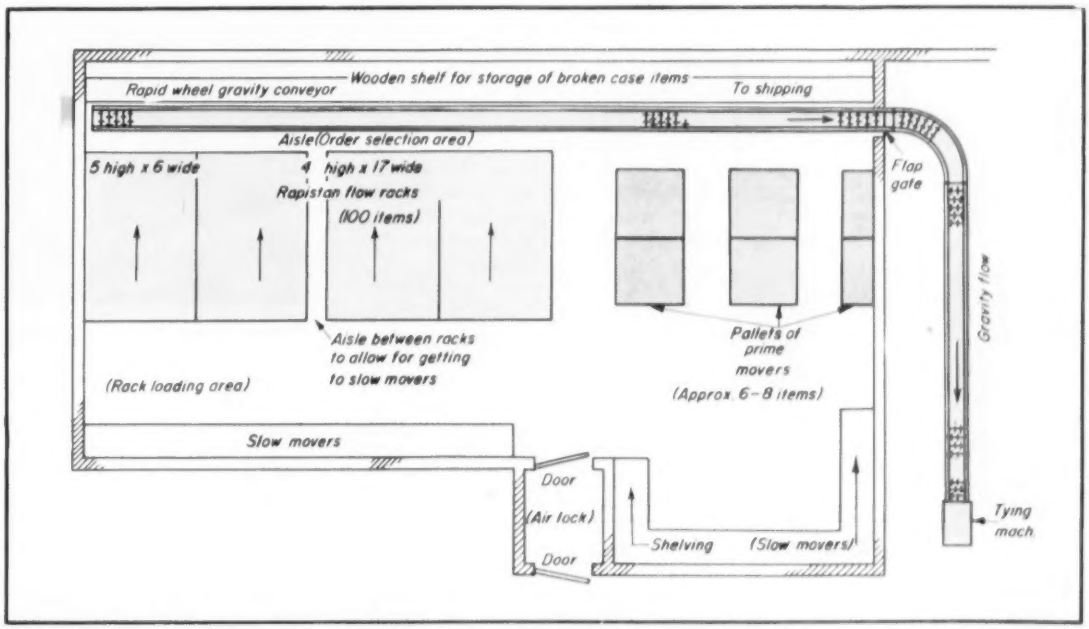
So they installed Rapistan flow racks (Rapids-Standard Co., Inc., Grand Rapids, Mich.)—four units with a total of 98 hatch openings. Running 10-ft. deep, the galvanized wheel conveyor sections can carry about 3,100 cases.

Fastest moving items are neatly palletized, and slowest moving ones are stored on shelves. The "in-betweens" are hand loaded into the racks each day from a lift unit.

During the night a two man team selects orders. By sharing the items on the order, neither man is ever required to walk more than 10 ft.

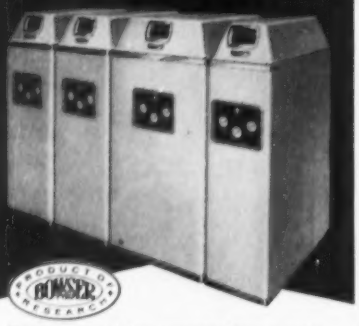
Completed orders are conveyed to the shipping and tying area.

Higher efficiency, improved housekeeping and inventory, and better use of air space and storage area have resulted.—*FE Staff.*



IMPROVED LAYOUT of cold room cut walking and searching time by 15% at once, may go still higher.

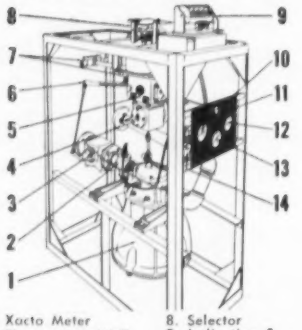
Blends many liquids automatically with unexcelled accuracy



Bowser precision proportioners automatically and accurately blend two or more liquids in closed, continuous production.

A simple setting of the percentage selectors provides any variation of blend from ½% to 100%. XACTO, "the world's most widely used meter," assures perfect proportioning of all liquids being mixed, compounded or blended.

SIMPLICITY OF DESIGN SAVES SPACE . . . REDUCES MAINTENANCE



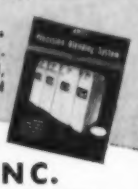
1. Xacto Meter
2. Thermometer Well
3. Inlet Control Valve
4. Differential
5. Control Nut
6. Valve Control Arm
7. Pump Control Circuit & Switch
8. Selector
9. Indicating & Totalizing Dial
10. Flow Indicator
11. Inlet Pressure Gauge
12. Discharge Pressure Gauge
13. Dial Thermometer
14. Discharge Check Valve

DIALS FOR EVERY PURPOSE

Model K — furnishes printed record of quantity dispensed or received for accounting; Model P—delivers predetermined quantities up to 10,000 gallons; Model RP — delivers predetermined quantities, repeating each quantity automatically.

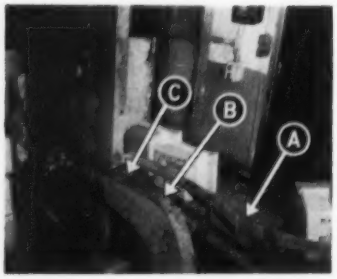
FREE OFFER . . .

Write for full color, 12-page Facts Folder titled, "XACTO PRECISION BLENDING SYSTEM."



BOWSER INC.
1326 E. CREIGHTON AVE.
FORT WAYNE, INDIANA

Practical Ideas



Automatic Carton Elevator

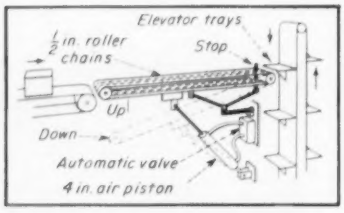
We saved ourselves several thousand dollars by designing and building our own automatic dumbwaiter-conveyor.

Formerly cartons of sliced products were transferred from the packaging department to basement storage on carts. These posed several problems. They were unwieldy, took up space, and presented the danger of damaging our new packaging units by colliding with them.

The space-saving conveyor has eliminated the need for carts, and is has a special loader (see sketch) that moves cartons, one at a time, without ever missing. This unit has a short section of conveyor belt (A in top photo) followed by another length of triple roller chain conveyor (B).

The stop at the end of the roller chains keeps boxes from moving into the conveyor shaft. And both conveyors are driven by the same motor.

As each tray on the elevator moves down it trips an automatic air valve. This releases compressed air to a cylinder that is hinged to the undercarriage of the roller chains. The back of the roller chain section is then tipped down. This also lowers the stop, allowing a carton to be moved onto a conveyor tray (C). At the same time another carton moves onto the roller chains from the belt conveyor.

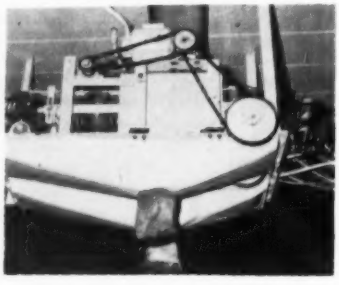


Air pressure in the double-acting cylinder then forces the roller chain section back into its high position.

Take-off-Device

Another interesting gimmick is present on the lower end of the conveyor. Here a springy stainless steel sheet (see lower photo) is so positioned that is is forced back by each tray support in its downward movement.

When a tray support clears the lower end of the stainless sheet it springs forward, shoving a carton off the tray and onto a roller conveyor.—*Gottlieb Loeffler, Mechanical Superintendent, Stahl-Meyer, Inc., New York City.*



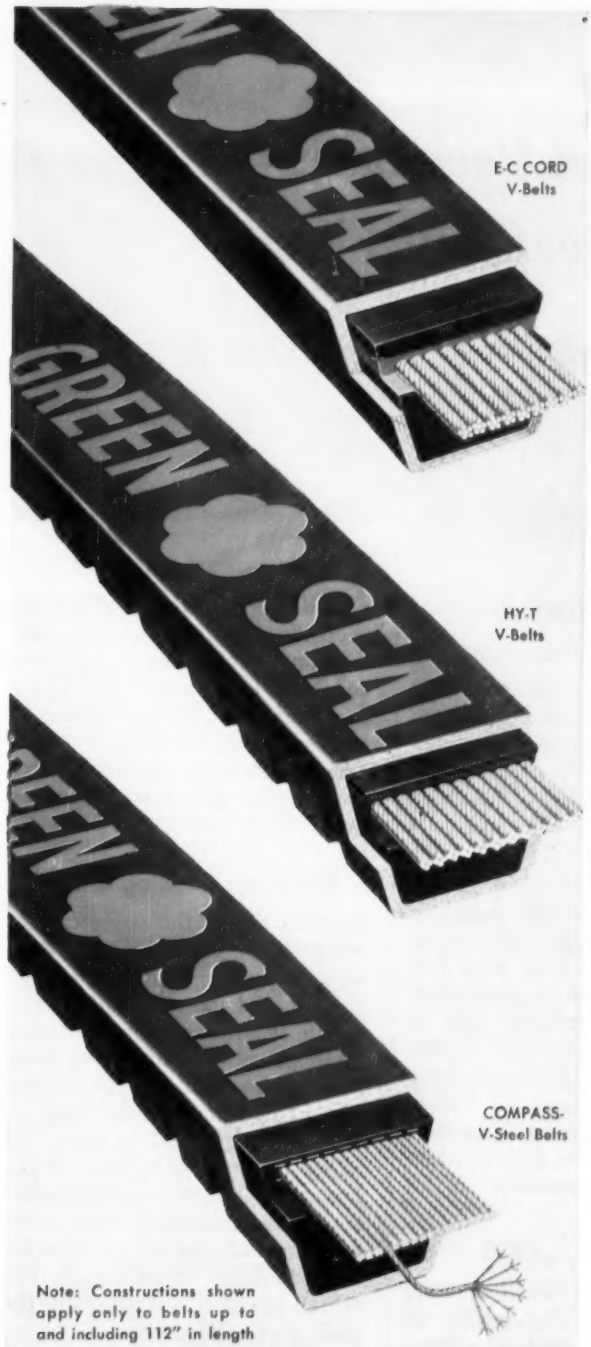
Beats Dust Out of Cans

Debris and dust from shipping cases often collects in empty cans used for packing shortening and lard.

They must be cleaned to prevent product contamination.

Here's how it can be done by a mechanical cleaner installed on empty can-feed lines ahead of filling machines.

First, put in a horizontal wire-rod conveyor (3½ ft. long) in the can-feed line (photo). Then attach a metal dust-collecting hopper (bolted



Why V-Belts with the Green Seal?

The Green Seal is put on each Goodyear multiple V-Belt for *your* protection. For it's your sign of a belt with dimensional stability—something long sought but only recently achieved in a complete line of V-belts.

What does dimensional stability mean to you? It means belt length remains the same from factory to drive. The length you order is the length you get. Matched sets stay matched. And mismatching – the biggest problem in belting multiple drives – is now a thing of the past.

How was this dimensional stability achieved? Until recently, stable belt length was possible only with steel cable load carriers as developed by Goodyear. But now it is also accomplished with synthetic cord through the exclusive Triple-Tempered 3-T process that stabilizes length by careful tempering with Tension, Temperature and Time.

Triple-Tempering also gives you a stronger, more shock- and stretch-resistant belt. Add "balanced construction" – with each component of the belt designed to its job – and you have a smoother-, longer-running belt which means maximum, trouble-free horsepower hours at minimum cost.

DIMENSIONALLY STABLE V-BELTS
with the GREEN SEAL by

GOODYEAR

THE GREATEST NAME IN RUBBER

The Goodyear Tire & Rubber Company, Dept. 794, Akron 16, Ohio

Please send me more information about how V-Belts with the Green Seal solve the major problem in belting multiple V-belt drives.

Name_____

Company_____

Street Address_____

City_____ **Zone**_____ **State**_____

Compass, E-C Cord, Hy-T, Green Seal—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

For more data, circle this page number on card at back →

Aluminum Foil Packaging– Resistance to Heat and Flame

Report No. 11 of a Series by Reynolds Metals Company

Aluminum foil is unique among flexible packaging materials in its resistance to heat and fire. It does not burn and alloys generally used for packaging do not melt until temperatures reach approximately 1200°F. Aluminum foil also maintains a far higher percentage of its strength at these elevated temperatures than any other flexible packaging material. And the aluminum foil does not become "tacky" or otherwise deteriorate at high temperatures.

These excellent high-temperature properties permit the use of aluminum foil packaging in applications for which other materials are entirely unsuited.

Advantages to Housewife

The housewife was one of the first to recognize the advantages of foil as a nonflammable wrapping and container material. She has learned that foil is valuable not only for wrapping all types of foods for storage in refrigerator and freezer, but also for preparing meals. Since it easily withstands oven and broiler temperatures, the housewife is able to save many hours of tedious kitchen work by wrapping meat and poultry in foil for roasting; by lining broiler pans with foil; by using it as a cookie sheet or as a drip catcher under a juicy pie. She lines baking dishes, too, so she never has to scrub "burned on" food from a casserole.

Package Acceptance

These now commonplace uses thoroughly familiarized the housewife with the heat-resistance of aluminum foil. They pre-conditioned her to the next great step —today's modern foil-packaged "convenience" foods.

This sweeping trend is a direct result of aluminum's heat resistance and nonflammability, and of the housewife's familiarity with foil, which leads her to accept so readily the idea of "cooking right in the package". Naturally, manufacturers and food processors have been quick to grasp the opportunity. Literally thousands of food products are now packaged in aluminum foil containers of all sizes and shapes.

Versatility of Foil

In many cases, the containers are tailored to meet the specific requirements of the particular product. These vary from circular "pie pans" of many different sizes to frozen dinner trays with individual compartments for vegetables and meat. In other cases, cartons are formed of paperboard laminated to light gauge aluminum foil. A large percentage of the prepared cake mixes sold today include disposable aluminum containers in which housewives can bake their cakes. And many food items are now appearing in heat-sealed foil envelopes which can be heated for serving by merely placing in a pot of hot or even boiling water.

Minimizes Cooking Chores

In every one of the above cases—whether the contents are frozen or not—the aluminum foil package provides a disposable container in which the food is prepared and often served without soiling utensils or dishes. Whether the heating or cooking is done in the oven, on the range or in boiling water, all of this is possible because of the heat resistance and nonflammability of aluminum foil. Yet this is only one of the many valuable characteristics of aluminum foil which make it outstanding for your packaging needs.

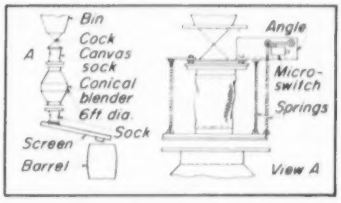
If you have a high temperature problem with your product, your local Reynolds representative will be glad to help you solve your packaging problems. Or you may write **Reynolds Metals Company,** General Sales Office, Louisville 1, Kentucky.

Watch Reynolds all-family television program "Disneyland", ABC-TV.

to angle irons) below the conveyor. Bottom of hopper is angled to a depth of 8 in. and drains to a 6-in. dia. dust-collecting sock.

On a horizontal, chain-driven shaft, mount a 1x18-in. beater rod with a 3-in. piece of rubber hose fastened to the end. Beater rod works off an eccentric cam to strike top of inverted empty cans at about 200 strokes per min.

Power is supplied to three sprockets and two chains (that drive the conveyor and shaft-mounted beater rod) by a ¼-hp. motor.—*FE Staff.*



Protects Shaker Screens

In our plant two conical blenders operate between bins and vibrating screens. Connections for filling and emptying are canvas socks attached to blender flanges. If the operator fails to detach the socks before starting the blender motor, both screen, bin, and sock may be damaged.

To prevent such damage we installed a Microswitch (see sketch) type BZE-2RQ in the motor starter circuit. This Microswitch is actuated by means of a spring and lever arrangement.

When the sock is detached from the flange of the shaker screen and removed, the tension in the spring which keeps the normally closed switch inoperative is relieved. This permits the lever which holds the switch open to swing and thus let the interrupted motor starter circuit to be closed. Starting of the shaker screen motor is then safe.—*J. F. Hutchinson, Plant Engineer, Exchange Lemon Products Co., Corona, Calif.*

Emergency Concrete Repair

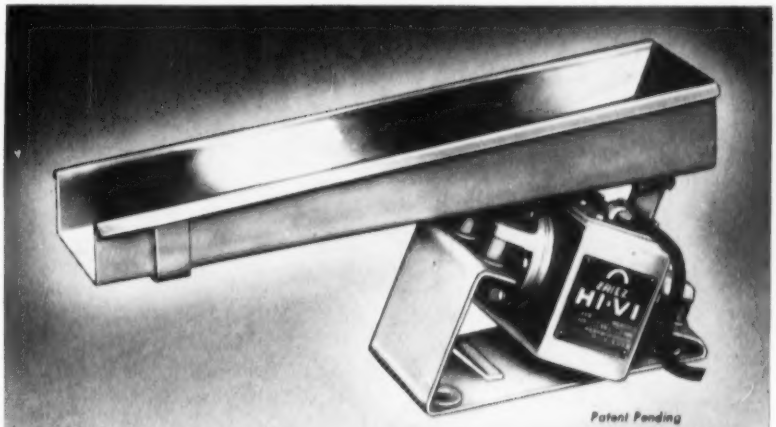
Here are steps for repairing cracked or honeycombed concrete floors:

1. Drill ½-in. hole in center of defective area.

2. Inject compressed air to force out water, grease, and loose residue. During this step watch gage pressure to prevent dislodging of large loose

NEW HI-VI FEEDER BY ERIEZ HAS THE FEATURES YOU'VE ALWAYS WANTED

REVOLUTIONARY NEW CONCEPTS in mechanical design and construction materials produced this outstanding new feeder. Based on results of field research, these new units incorporate many of the features asked for by people who use feeders. Available in a wide range of sizes to meet all needs, Eriez feeders give you higher operating efficiency over broader operating ranges—*let you move more materials faster!*



Patent Pending

- **Greater capacity than comparable size units**
- **Totally enclosed drive element**
- **Rust-proof long-life spring**
- **More uniform feed**
- **No rectifier needed**

NO RECTIFIER NEEDED! Just plug or wire in these new feeders; they operate at 3600 CPM directly off an AC line. No rectifier is needed, as a lifetime-powered magnet replaces this element by providing an automatic, inherent magnetic rectification system which is simple, trouble-free and highly efficient. All energy (a two-way push-pull vibrating action) goes for productive performance.

TOTALLY-ENCLOSED DRIVE ELEMENT: can't be damaged or lose efficiency due to contamination by moisture or foreign materials.

DISC-SHAPED GLASS FIBER SPRINGS: rust-proof, they're not subject to corrosion, "packing", fatigue or other critical characteristics of steel leaf spring systems.

GREATER OUTPUT CAPACITY: more work output than any other feeders of comparable physical size.

OTHER FEATURES INCLUDE:

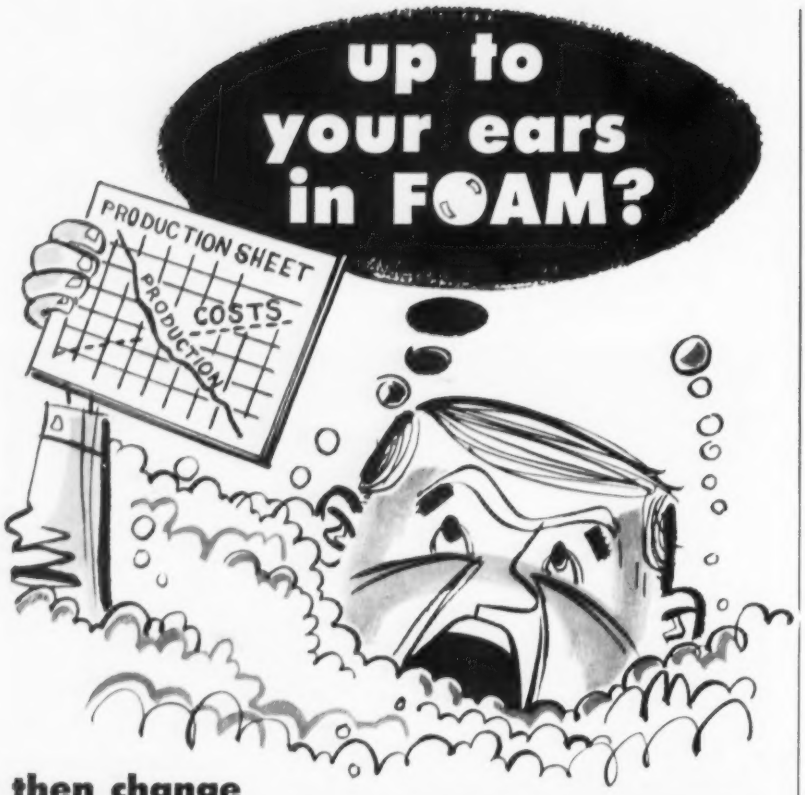
Almost silent operation • Rectangular-shaped tray bottom for more uniform feed • Larger, more powerful Alnico V magnetic drive element • Compact base for tandem, side-by-side or back-to-back installations • Less sensitive to voltage change • No "air gap" adjustment needed • Units are lightweight, compact, easily installed • No sliding or rotating parts to wear • Low power consumption, maintenance and operating costs

An Eriez Feeder provides accurate, controlled feed of bulk materials variable from ounces to tons per hour — *automatically.* Works well with all types of materials: hot, dry, dusty, lumpy, abrasive, etc. Conveys, spreads, agitates, separates, blends, dries, cools and mixes—economically and in a minimum of space.

Only Eriez Feeders have HI-VI drive systems — powered by an Alnico V magnet that's permanent . . . will never wear out!

ERIEZ HI-POWR MAGNETIC SEPARATORS
ERIEZ HI-VI VIBRATORY EQUIPMENT

Interesting new booklet tells all about the Eriez line. For your free copy, write to Eriez Mfg. Co., 106-W Magnet Dr., Erie, Pa.



then change to a Dow Corning SILICONE DEFOAMER

Why continue to let foam rob you of valuable processing space, inflate your costs, smother your production schedule? Why indeed, when only a teaspoonful of a Dow Corning SILICONE DEFOAMER will prevent mountains of that wasteful foam . . . help you operate at full capacity.

Now there are two Dow Corning SILICONE DEFOAMERS for food processors—both so efficient they pay for themselves many times over:

ANTIFOAM A Compound—permissible to use in processing nonstandardized foods at concentrations up to 10 ppm.

ANTIFOAM AF Emulsion (water dilutable)—permissible at concentrations up to 34 ppm.

And remember, when you use one of these economical silicone defoamers, you also free yourself from the worry and mess of unsanitary boilovers and the extra maintenance costs that result. So—stop choking on your FOAM problems—change to a Dow Corning SILICONE DEFOAMER.

first in silicones

FREE SAMPLE

Put Dow Corning SILICONE DEFOAMERS to the test. Use the coupon below or write on your letterhead to receive a free trial sample. No obligation, of course.

Dow Corning CORPORATION
MIDLAND, MICHIGAN

5521

NAME

TITLE

COMPANY

CITY ZONE STATE

My foamer is

Oil system

Aqueous system

Other

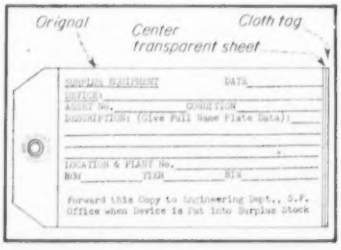
Practical Ideas

sections. Also note spots where air venting occurs.

3. Force in sodium silicate (diluted ½ to ⅔ with water) under pressure.

Areas up to 30 ft. dia. have been repaired in this manner. Large cracks can be filled with a mixture of cement and sodium silicate, and floor level seepage can be sealed by puddling dry cement into the oozing silicate.

Pressures up to 125 psi. may be required to do a good job.—"Silicate P's & Q's" publication of Philadelphia Quartz Co.



Keeping Tab on Extra Units

Large amounts of useful surplus equipment are often accumulated by big plants. Unless there is some way of reporting the existence of this valuable material to a central office, it may lie idle for years. Such a condition leads to waste of storage space, investment, and taxes.

However, money can be saved if a central department has information accessible to those who plan to use and purchase equipment and materials.

A practical method calls for speed, minimum clerical and hand labor, and ease of locating desired equipment. Such a system is shown here. It consists of two parts: The original information and the record.

The original information is provided by a three-part tag (see sketch). Exact wording and dimensions can be chosen to suit individual needs. A piece of double-sided carbon paper is inserted between the center transparent sheet and the cloth tag. Then, all three are simultaneously completed.

The tag is fastened to the equipment, the top sheet sent to the central office, and the carbon copy retained in the plant.

When a unit is withdrawn from storage the tag is completed to show date and transfer order number. Routing of the tag to the plant

IMITATION VANILLA BEAN FLAVOR BY FIRMENICH

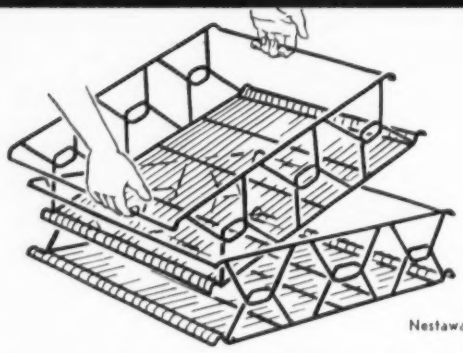
Vanilla Bean Flavor by Firmenich stems from the vanilla bean. By original research, its components and desirable characteristics have been isolated, identified, and synthesized. By patient and painstaking laboratory techniques, they have been reconstructed for you in a precise and potent flavor material with all the aromatic qualities of the original. Vanilla Bean Flavor by Firmenich comes to you as an economical replacement of pure vanilla extract, of pure vanillin, or to use in combination in the manufacture of all products that you flavor with this most popular of flavors. Contains no coumarin.

FIRMENICH & CIE
SUCCESSEURS DE
CHUIT, NAEF & CIE.
GENEVE SUISSE

FIRMENICH INCORPORATED

Nestaway Racks are Patented!

FULLY PROTECTED BY PATENTS IN THE UNITED STATES AND CANADA



Line drawing showing patented nesting feature of Nestaway Bread Racks.

Because the nesting and stacking feature of our racks, which are a part of our Nestaway System, is so highly successful, it is being copied by manufacturers who are infringing upon our patents, and are liable.

Unfortunately, these people are also making liable, under law, any person who buys or uses a system which infringes upon our patents. As a prospective user of this type of bakery handling equipment, we want you to know this so you will not be a party to this infringement. Insist upon NESTAWAY — the patented complete system for handling bread and baked goods from the wrapper to the consumer.

Our PATENTED Nesting features save up to 78% Valuable floor Space!

You can store 56 *empty racks* in the same space 12 filled ones require, thanks to our nesting feature! Save this valuable floor space—and save time and labor too! One truck can transport the empties from four trucks of filled racks! Loading and unloading time is cut 40%!

Write, wire or call Today . . .

MID-WEST METALLIC PRODUCTS, INC.
MATERIAL HANDLING DIVISION
450 FILM BUILDING • 2108 PAYNE AVE. • CLEVELAND 14, OHIO

MWM NESTAWAY
"Engineered Material Handling Systems"

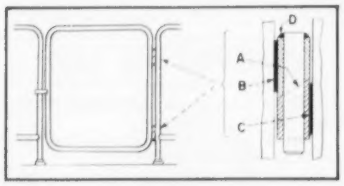
office follows, where the transparent carbon copy is removed from the file. The cloth tag is then forwarded to the central office to show that the original should be taken from the file there.

Note that at this point writing has been done only once. This writing would have to be done on some sort of sheet anyway if periodic inventory reporting is done.

In a small plant, filing original and carbon copies in boxes equipped with suitable dividing cards may be enough.

On the other hand, if there are thousands of items located in many plants it would be wise to transcribe the original data onto some sort of subdivided hinged cards (such as Kardex or Acme), hung in trays, so that equipment can easily be found by make or characteristics.

In contrast to periodic inventories that provide infrequent corrections to surplus records, this system has up-to-date information. The only time lag is tag travel time from plant to office.—*Robert S. Wilson, Electrical Engineer, Richmond, Calif.*



Simple Self-Closing Gate

Heavy fork-truck traffic, in a plant where cans are made on a battery of automatic machines, necessitated dividing the units from the main gangway by means of tubular railings. (See sketch.)

As originally fitted, the gates in the railings tended to open, or were accidently left open. Fork-truck drivers had to stop and close the gates in order to travel down the gangway.

To make the gates self-closing, modified hinges (inset) were installed. Each hinge comprises a short piece of steel tube that is cut in half at an angle of 60 deg. (A) to the axis. Upper half is welded to gate (B), and lower piece to the post (C). A hinge pin is welded in place at the top (D) to connect the two pieces of tubing.

When the gate is opened, it is raised slightly by the action of the

AUTOMATIC PACKAGING

means lower costs and increased production!

Jack's Cookie Co., of Tampa, Florida, is saving "even more than anticipated" with their Hayssen equipment.

● From the oven to the shipping carton, Jack's Cookies are handled automatically by Hayssen. The oven conveyor feeds directly into the hopper of a Hayssen automatic "LIFT" elevator conveyor. Gently raised and discharged into the high level feed of the Hayssen "COMPAK," the cookies are weighed and bagged. The "COMPAK" forms the bag from roll film, with perfect electric eye registration of printed design, automatically fills and hermetically seals. Through Hayssen's quick, easy roll stock changing, Jack's is ready to package one variety after another in a matter of minutes.

Let our experienced packaging engineers help you with your packaging problems. Contact us today!

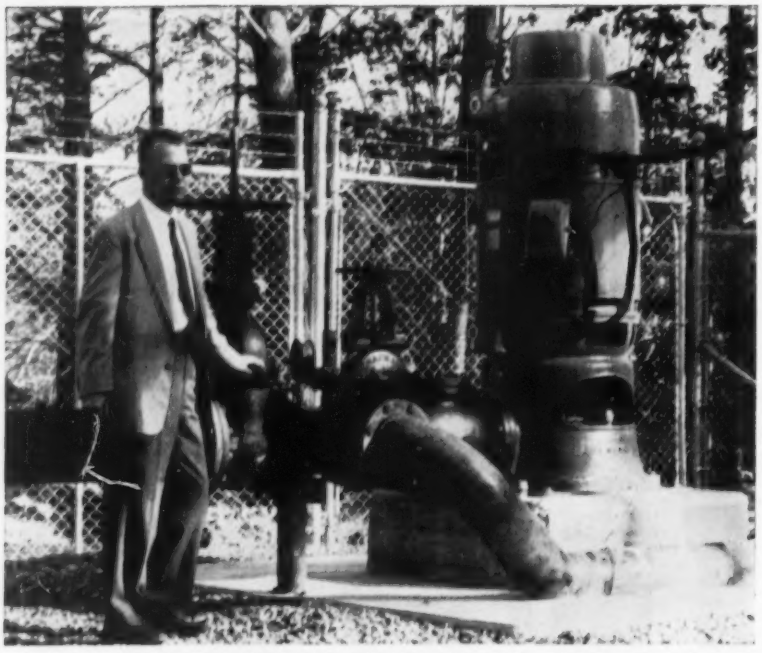
HAYSSEN

MANUFACTURING COMPANY • Dept. FE-9 • SHEBOYGAN, WIS.

first in Automatic Packaging Since 1910

Albany • Atlanta • Chicago • Dallas • Denver • Detroit • Houston • Jackson, Miss.
Los Angeles • Minneapolis • New York • Philadelphia • St. Louis • San Francisco • Montreal • Toronto

For more data, circle this page number on card at back →



This Deming 4700 Vertical Turbine Pump discharges 1600 gallons of water per minute!

HOW LOW COST WATER
CAN ADD TO PLANT PROFIT

High cost water can be an important factor in plant operating costs . . . knowing this, one eastern paper manufacturer checked into possible savings that might result from establishing and operating his own water supply.

First—A Deming distributor was consulted. Sydnor Pump and Well Co., Richmond, Virginia, made a preliminary survey of the ground water characteristics of the area.

Second—A test well was drilled to obtain complete geographical data.

Third—After studying survey results and geological data, a well 16 inches in diameter, 750 feet deep was drilled. A Deming 4700 Vertical Turbine Pump, water-lubricated type, was installed with a setting of 250 feet. The pump discharges approximately 1600 gallons per minute.

"We selected this Deming Turbine Pump for its water-lubricated design and semi-open, easily-adjustable impellers," said Mr. H. C. Berkely of Sydnor Pump and Well Co.

A Factory-Owned Water Works

This installation by an experienced Deming distributor meets the customer's present volume needs for pure water and provides for increased volume needs at lower cost.

For specific data on Deming Vertical Turbine Pumps, write for free BULLETIN 4700-A.

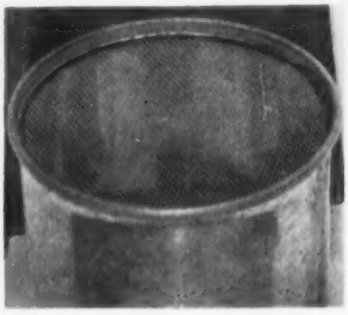
THE DEMING COMPANY— 556 Broadway - Salem, Ohio

DEMING

INDUSTRIAL PUMPS

Practical Ideas

sloping faces of the tube sliding upon one another. When the gate is released it closes automatically.—*C. T. Bower, Tool Engineer, London, England.*



How to Make Handy Screen

Here's how to make a useful strainer for laboratory use (see photo).

First cut a ring in a can top using a circular expansion sheet metal cutting tool. The pilot point should be centered exactly, so that a uniform cut is made leaving a ⅛-in. ledge on the inner part of the can-top ring.

Then cut the screen wire square

CAN YOU USE $50?

Then here's an opportunity to get it.

Send one of your ideas to FOOD ENGINEERING.

Each month $50 is presented to someone like you for the best item in this department. And the chance that it will be you is now running about one in ten.

Also $5 to $15 (sometimes even more) is paid for each contributed item used. So a few minutes time may net you as high as $65.

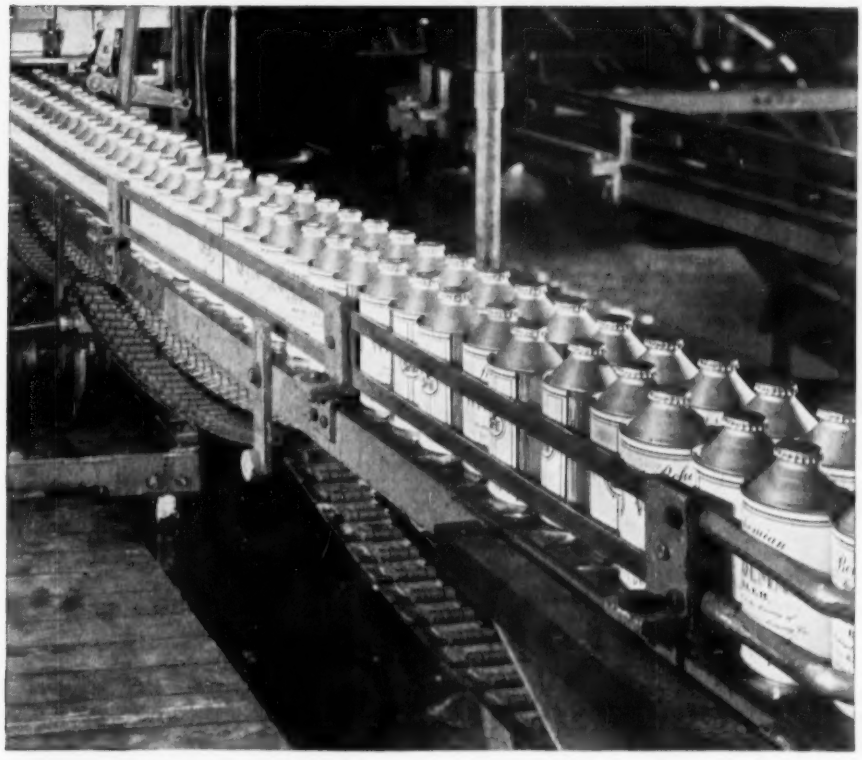
Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to illustrate it.

We'll do the finished writing and drawing for you.

Send it today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y. —The Editors.

JUNE PRACTICAL IDEA WINNER WAS "Turns Cartons 90 Deg. for Printing," submitted by W. F. Attinger, Plant Manager, Continental Nut Co., Chico, Calif. (Winners are chosen by Readex, a foremost outside survey agency that regularly polls many scores of FE readers throughout the country.)

Link-Belt S-815 flat-top chain improves food container handling



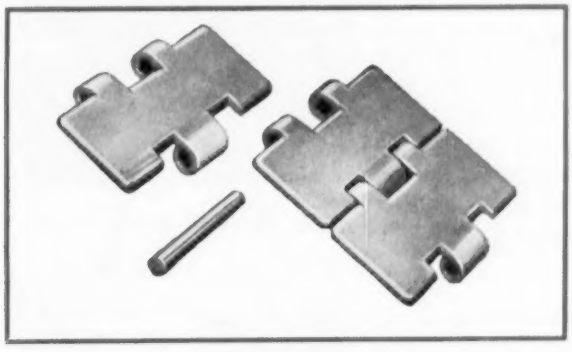
Offers conveying flexibility—simplifies assembly, maintenance

Link-Belt S-815 flat-top chain presents a safe, smooth conveyor path for handling food and beverage bottles, cans and similar containers through washing, filling, capping and other operations. Designed to simplify conveying in bottling plants, canneries and dairies, S-815 chain is readily adaptable to new or existing machines.

One-piece links are formed from steel strips and connected by steel pins. Top edges of links are beveled to permit free movement of containers across the surface. Pins can be quickly removed for easy maintenance and chain adjustment.

Available in five widths—in carbon or stainless steel. And its simple design eliminates dirt-catching pockets and crevices—an important feature where sanitation is essential.

LOW-COST S-815 flat-top chain conveys cans of beer from filling and capping machine. Smooth, unbroken carrying surface of chain reduces danger of tipping.



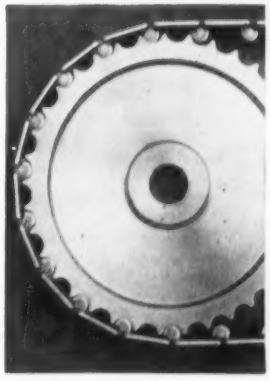
One-piece S-815 link serves as integral carrying platform

One-piece links, with beveled edges, dovetail with adjacent links to form a smooth, continuous carrying surface. Elimination of the straight-line lateral gap between links removes the danger of tipping or jamming stalled containers, permits chain to slide freely under them. Chain can be detached at any convenient pitch by merely removing the connecting pin. Ask for Folder 2344.

Unique design of S-815 sprockets doubles life

Specially designed cut-tooth sprockets for Link-Belt S-815 flat-top chain provides twice the necessary number of teeth, doubling wheel service life. This design refinement insures close control of tooth profile and dimensional specifications, resulting in proper chain engagement . . . minimum wear . . . quiet, smooth operation.

In operation, links contact every other tooth. Odd number of teeth in sprocket automatically distributes wear. However, similar service can be obtained with even number of teeth by periodically indexing the sprocket one tooth.



HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

For more data, circle this page number on card at back →

Safe
Sure
Yellow
Pure

Coloring For Your Foods

Beta CAROTENE 'Roche'

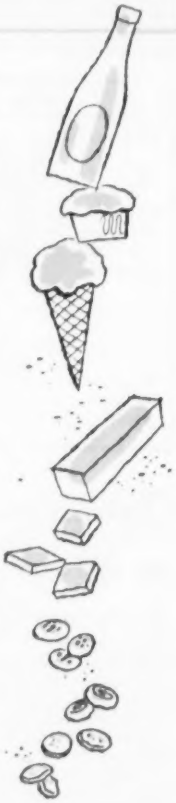
WITH VITAMIN A POTENCY

HIGHLY PURIFIED CAROTENE YELLOW. Beta Carotene 'Roche' is carotene in the most highly purified form available commercially. It is free of other carotenoids, whose variable color values and lower vitamin A potencies often cause trouble in food processing. Standardize on beta carotene 'Roche' for *true carotene yellow color* without any tinge of green or red. *You'll have a better product to make your product better.*

Pure beta carotene 'Roche' crystals The Peak of Purity

SAFE AND SURE. Beta carotene is one of nature's own coloring agents. *It belongs in foods.* Even though pure beta carotene has always been considered harmless, Hoffmann-La Roche as usual took nothing for granted. During the past three years, our laboratories conducted extensive acute and chronic toxicity tests which clearly demonstrated the safety of 'Roche' beta carotene when it was administered in massive doses to test subjects over long periods.

BETA CAROTENE 'ROCHE' represents the peak of beta carotene purity and uniformity. Derived from citral obtained from lemon grass oil or other natural products, and produced by a new scientific process, the Roche product is identical chemically and biologically (as provitamin A) with beta carotene as nature makes it.



BETA CAROTENE 'ROCHE' is not a coal tar color! Beta Carotene 'Roche' does not contain coal tar! Beta Carotene 'Roche' is not in any way derived from coal tar, nor is any coal tar constituent introduced into the molecule during the Roche process of manufacture.

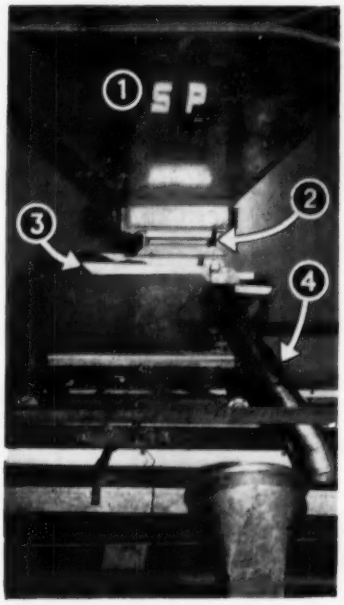
Since beta carotene 'Roche' gives safe yellow color with vitamin A activity (inherently included at no extra cost), it is preferred by margarine manufacturers and other food processors. We have convenient blends in sanitary tin cans or a stronger 24% semi-solid suspension (400,000 U.S.P. units of vitamin A activity per gram) in sealed, sanitary metal containers. Special forms in special packings for special purposes are available. Our technical people want to help you.

VITAMINS COME RIGHT FROM ROCHE

Vitamin Division • **HOFFMANN-LA ROCHE INC.** • NUTLEY 10, NEW JERSEY
NUtley 2-5000 • In New York: OXford 5-1400

(monel metal, stainless steel, or other wire may be used), leaving at least ½-in. overhang all around the can. Set the wire in the open end of the can and place the cut-out ring in position for sealing. During the first turn of the closing operation the screen is cut as close to the outside edge of the screen as possible.

Finally, after the wire is sealed on the end of the can, the bottom is cut out. This produces a screen that is strong and rigid, and can be sterilized or freed of solid particles using direct flame, if desired.—*W. B. Coleman, Mechanic, Agricultural Expt. Sta., U. of Florida, Gainesville.*



Coordinating Bins and Belts

Nut meats are conveyed by overbin belts and stored, according to lot and grade, in one of 38 bins at Diamond Walnut Growers, Inc., Stockton, Calif. This stock moves quickly from these bins into process.

The method of identifying each bin-full, in view of its short residence here, presented a problem. This was easily solved by using interchangeable, cut-out letters having two small magnets on their reverse sides (1 in photo). Using a simple identification code the proper letters are stuck to the sides of the metal bins as they are being filled, removed when being emptied.

These different lots and grades are conveyed separately to hoppers serving 50 electronic sorting machines by a complex conveyor-elevator sys-

Yes!

GLOBE hycar BELTING

IS NOW AVAILABLE

GLOBE HYCAR BELTING gives you all the benefits you ever expected for food conveying, PLUS many new features. It resists those animal fats, vegetable oils and greases that deteriorate natural rubber and Neoprene.

IT STAYS pliable at 30° to 40° F below zero, maintains stability at 250° F above zero — and resists cracking after long service.

GLOBE HYCAR BELTING is odorless, tasteless, non-toxic, non-porous and non-contaminating. It is easy to clean and keep sanitary. In cut widths up to 48 inches.

WHITE HYCAR, for conveying, in 2 to 5 plies inclusive.

GREEN HYCAR, for picking and sorting tables, in 3 ply only.

OTHER GLOBE PRODUCTS FOR THE FOOD INDUSTRY:

WHITE SOLID WOVEN COTTON BELTING • IMPREGNATED PRESS-CURED BELTING • WATERPROOF AND WAX TREATED BELTING • KANRY-TEX BELTING • NEOPRENE BELTING • PLASCELL BELTING • CELLULOSE BELTING • STITCHED CANVAS BELTING • ROUND BRAIDED ENDLESS BELTS • HEVALOID ENDLESS BELTS • WOVEN ENDLESS BELTS • CLEANER AND SIFTER BRUSHES • WEBBINGS • HOISTING SLINGS • BELT DRESSING

When you need belting, call a Globe engineer.

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET • BUFFALO 6, NEW YORK
KNOWN FOR QUALITY THE WORLD OVER

For more data, circle this page number on card at back →

tem. Bin discharge-gates (2) are centrally located between the two take-away belts, and these conveyors are each divided in half by metal sides, making essentially 4 conveyors. These discharge first into two elevators and then into two overhead belts, both of which are identically divided.

Nut meat stock discharged to conveyor No. 1 must end up on the corresponding overhead conveyor. To achieve this, mobile vibrator-feed and swing-chute units were devised. Four of these units may be moved on rails located just above the take-away belts. A unit is positioned under a bin discharge-gate and the gate opened. Vibrator pan (3) speed is adjusted for proper unloading volume, and swing-chute (4) is positioned above the selected conveyor. —*FE Staff.*

Washing stage in Seabrook Farms processing line. Here Kale is being washed and will next go into steam room for blanching. All water is chlorinated.

HOW W&T IN-PLANT CHLORINATION

increases vegetable processing rates

Seabrook Farms at Seabrook, N. J. processes over 100,000,000 pounds of frozen food annually. For every 10 ounce package of frozen food, an average of 7 gallons of chlorinated wash water is used.

Mr. E. L. Morin, head of Seabrook Farms quality control department says, "By the introduction of Wallace & Tiernan Chlorination equipment into our in-plant process, we have reduced our clean-up periods by 50%. We must process at top capacity during harvest seasons; reducing clean-up time increases our daily production rate. In the instance of peas alone, In-Plant Chlorination reduced clean-up times during a 24 hour period from two hours to one... still maintaining standards of low bacteria counts in the product."

For information about W&T In-Plant Chlorination send for Bulletin I-57.

WALLACE & TIERNAN INCORPORATED

25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

MERCHEN GRAVIMETRIC FEEDERS & METERS

for dry free-flowing materials

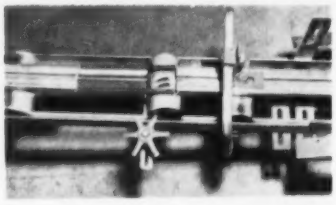
- automatic batch control
- continuous blending
- materials accounting

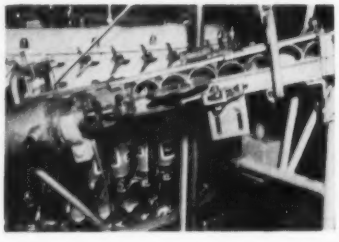
Accuracy 1%
Rates 3 to 3000 lbs. per min.

Write for Bulletin No. M-32

WALLACE & TIERNAN
INCORPORATED
25 MAIN ST., BELLEVILLE 9, N. J.

M-32



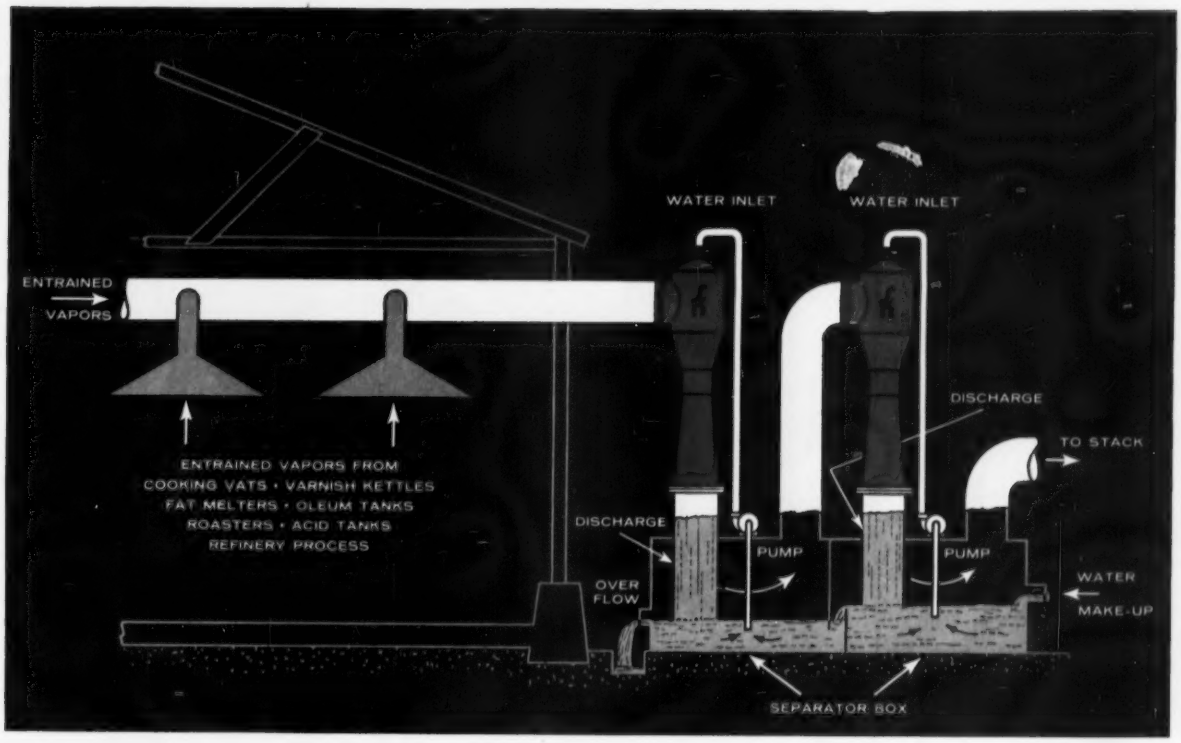


Filling Machine Protection

When cans get turned upside down on modern high-speed filling lines, it's sure to cause a mess. To prevent these 'upturns' from entering fillers, we developed two quickly installed devices and located them at different points on can-handling lines.

Where cans are rolling freely and are not packed together—say, just after the unscrambler—first device (see top photo) will work satisfactorily. It consists of a star wheel, mounted on a piece of strap metal that is bolted to the can track. Distance between points on the star is slightly less than the can diameter.

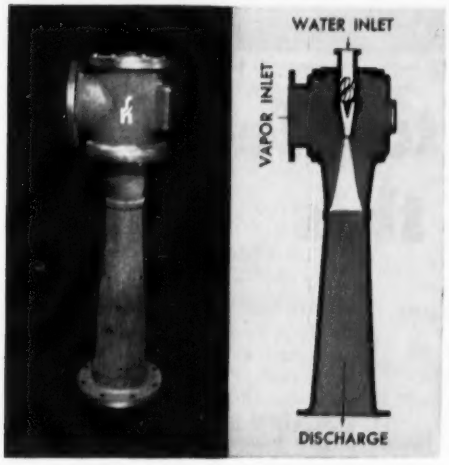
Open end of the cans will rotate the star. But, if closed end of a can is presented, a point will catch on



CONTROL OBJECTIONABLE FUMES, GASES, VAPORS

with an economical SK Fume Scrubber

Photo and sectional drawing of an SK Fig. 4010 Fume Scrubber



A food plant in California uses an SK Fume Scrubber to condense steam and scrub oil vapors from cooking vats. A large chemical manufacturing plant on the eastern seaboard uses a battery of SK Fume Scrubbers to condense steam and purge entrained gas containing H_2SO_4, SO_2, H_2S, TiO_2, and ore dust. A mid-western manufacturer uses SK Fume Scrubbers to vent oleum tanks. A soap maker in Pennsylvania uses a scrubber to remove ammonia fumes from a plant building and cool the building at the same time.

From coast to coast, chemical and food processing plants, refineries, paint and varnish manufacturers, fertilizer, and other manufacturing plants are using SK Fume Scrubbers to control objectionable—sometimes dangerous—fumes, gases, vapors, and dusts.

These manufacturers have found that SK Fume Scrubbers are reasonably low in initial cost, require little maintenance, and are an effective means for conforming to local ordinances which prohibit the pollution of air.

Made in a wide range of sizes from cast iron, steel plate, Haveg, stoneware, or other materials or with linings of rubber or Polyvinyl Chloride, or other synthetic materials, SK Fume Scrubbers can help you solve a fume or dust problem. Why not get the whole story. Send for Bulletin 4R which contains complete information on SK Fume Scrubbers.

JET APPARATUS: Ask for Condensed Bulletin J-1.
ROTAMETERS & FLOW INDICATORS: Ask for Condensed Bulletin 16-RA.
VALVES: Ask for Condensed Bulletin V-1.
HEAT TRANSFER APPARATUS: Ask for Condensed Bulletin HT-1.
GEAR PUMPS: Ask for Bulletin 17-A.

Schutte and Koerting
COMPANY
MANUFACTURING ENGINEERS SINCE 1876
2223 State Road, Cornwells Heights, Bucks County, Pa.

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B.F.Goodrich report:

High-pressure cleaner made by Malsbary Manufacturing Co., Oakland, Calif.

Hose used to go to pieces on jobs like this

B. F. Goodrich improvements in rubber brought extra savings

Problem: In this meat-cutting room they use scalding steam to clean grease from floors and work tables. But the steam hose went to pieces in a few months. Grease made the cover swell, turn gummy. The slightest snag tore it. The equipment maker needed a hose that could stand the grease, as well as heat and pressure.

What was done: B.F.Goodrich engineers went to work on the problem. They developed a hose with a special rubber cover that resists oil and grease. For extra strength they used a layer of fine-braided steel wire as reinforcement, to protect against blowouts. Heat resistant rubber is used inside the hose and between the plies.

Savings: Where hose was lasting months, B.F.Goodrich hose is now giving years of service. In fact, the maker of this steam-cleaning equipment now uses B.F.Goodrich hose 100%.

Extra benefits: In addition to making this hose oil and grease-resisting, B.F.Goodrich also made it light and flexible so it's easier to handle.

Where to buy: Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich steam hose described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-172, Akron 18, Ohio.*

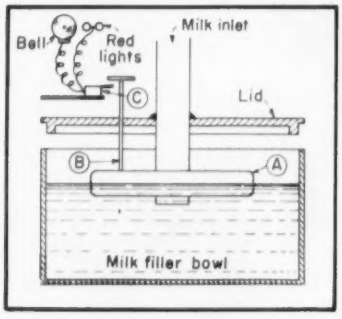
B.F.Goodrich
INDUSTRIAL PRODUCTS

the lid rim and halt the can. The two springs located above the star, provide the simplest way to keep cans in the track—yet provide for quick removal of wrong-way cans.

Where cans are packed closely together—as they are just before reaching the filler—the pointed star won't work. But, the second device, (see photo above) has proved efficient.

Here, a clover-leaf wheel cut from sheet metal is used. Leaves are slightly less than diameter of can. Unit is mounted on a spring-loaded arm. And again, a closed-end can will be stopped on the track.

Hinged track section is held down by weight of a piece of shafting or other scrap metal welded to the top of the section. It forms a handy handle for lifting track and removing reversed cans.—*Ed. O. Nelson, American Can Co., Geneva, N. Y.*



Warns of Low Filler Level

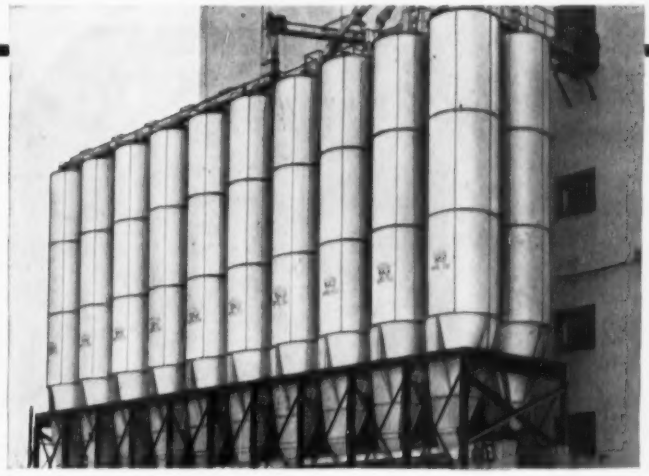
When our supply tanks were emptied, or fillers ran low on milk, we would have quite a loss of paper bottles, due to light filling or no filling at all.

On a high-speed filler the operator had no indication of a low supply bowl. Therefore, we devised a methods that gives ample warning when our milk drops below regular filling level.

As the filler-bowl float (A in sketch) descends it pulls the rod (B) with it, making contact with a Microswitch (C), that activates a bell and two flashing red lights. Our operator then knows that his machine is going empty, and he can slow it down, thus keeping wasted bottles to a minimum.

This system is installed on our Senior Pure-Pak, and 176 and 334 Canco machines. — *Paul Palmer, General Plant Foreman, Borden's Dairy Delivery Co., Fresno, Calif.*

Cut Material Handling Costs with DAY BULK MATERIAL TANKS

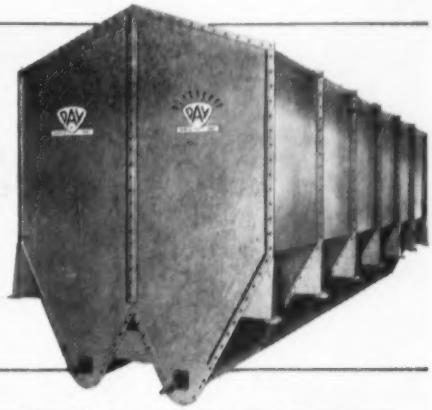


Each of these DAY vertical bulk material tanks has an approximate storage capacity of one carload. They serve as storage tanks for a packaging line as well as for truck and railcar loading. Every day more and more plants find large quantities of dry bulk materials can be handled more economically using DAY bulk material tanks. They save labor, containers and storage costs.

DAY bulk material tanks are made of black iron, galvanized or stainless steel. They are built and shipped in *easily erected, bolted sections.* Vertical tanks are furnished in sizes from 3 to 14 feet in diameter, up to 100 feet high. No support is required above the cone level. Patented, suspension discs are available for vertical type tanks to prevent bridging and assure free flow of product.

DAY Horizontal Bulk Material Tanks

Using DAY horizontal bulk material tanks, companies report savings of up to 25¢ per bag compared to handling bulk materials in bags. Ideal for buildings with limited headroom. Standard or special sizes available. Low installation cost.



For detailed information on bulk material storage tanks and pneumatic conveying equipment to suit your production and storage needs, write toDAY for Bulletins 529 and 549.

The **DAY** *Company*

Sold in United States by
The DAY SALES Company
817 Third Ave. N.E., Minneapolis 13, Minn.

Made and sold in Canada by
The DAY Company of Canada Ltd.
P.O. Box 70D, Fort William, Ontario

Representatives in Principal Cities

DAY BULK MATERIAL HANDLING SAVES MONEY

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New J-M offers ...plus

After the cold room is insulated with Rock Cork, the walls and ceiling are permanently and neatly finished with rigid, rugged J-M Asbestocite® Sheets.

Stops Flame

Rock Cork successfully passes, with the highest "incombustible" rating, the Columbia Fire Test as contained in the National Bureau of Standards' Commercial Standard CS131-46.

JOHNS MANVILLE JM PRODUCTS

Johns-Manville *incombustible*

← For more data, circle this page number on card at back

Rock Cork Insulation

outstanding temperature control

4 other advantages vital to modern cold-room service!

For half a century, Rock Cork insulation has been the industry's choice for precision low-temperature control.

And there's little wonder why! For, unlike ordinary low-temperature insulations, Rock Cork is unaffected by moist cold-room atmospheres. This means that its low conductivity stays low in service to permit close, economical control of cold-room temperatures . . . with the consequence of noticeable savings in daily power costs. More important, these savings continue through the life span of Rock Cork, which is measured, not in years, but in decades.

For today's service, new Rock Cork offers you still more advantages: It stops flame to minimize fire hazards . . . It is dimensionally stable . . . Sanitary and odorless . . . Quickly, easily installed.

Rock Cork is available in sheets and pipe insulation in standard sizes and thicknesses. For complete information on this new development in refrigeration insulation, call your J-M representative or write to Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario.

A. I. A. FILE NO. 37-D-I

Sheds Water

Rock Cork won't absorb moisture, maintains its thermal effectiveness under conditions of humidity and condensation usually present in cold-storage rooms.

Easily Installed

Rock Cork comes in large, structurally strong sheets for fast, economical installation . . . or as pipe insulation Rock Cork is accurately formed to assure a perfect fit.

Doesn't Shrink

Joints stay tight in the coldest freezer room because—unlike ordinary organic insulations—Rock Cork doesn't shrink with sudden changes in temperature.

ROCK CORK INSULATION

FOR LASTING THERMAL EFFICIENCY

For more data, circle this page number on card at back →

NEW! direct tank-mounted LIQUID LEVEL TRANSMITTER

Exclusive static pressure connection for closed vessels above or below atmosphere . . . eliminates need for second instrument.

This sensing diaphragm capsule flange-mounts directly on side of tank. All wetted parts of Type 316 stainless steel, with optional plastic coating for further corrosion protection.

with DIRECT 3-15 psi air output signal

IDEAL FOR: Evaporators and other process vessels containing highly viscous or corrosive fluids, slurries, and solids-in-suspension.

Now you can measure the level of any "difficult" or easy-to-measure fluid — economically, without the complication of floats or bubble tubes, and with *sustained high accuracy over the entire range span.*

Flange-mounted directly to the side of an open or closed tank, the Type 13FA Transmitter eliminates piping and purging. Its stainless steel diaphragm capsule senses level changes instantly. Conventional tubing leads its output air signal directly to standard 3-15 psi receiver-recorders and controllers without need for intermediate signal converters.

Wherever level measurement is a problem, the 13FA provides an accurate, trouble-free solution. Write for detailed information, or ask your nearby Foxboro Field Engineer to explain its application to your specific process. **The Foxboro Company, 309 Neponset Ave., Foxboro, Mass., U.S.A.**

FOXBORO

REG. U.S. PAT. OFF.

LIQUID LEVEL TRANSMITTERS

New Keys to Progress in Food Manufacturing

There are three new keys to progress that food company management must try to turn.

One is automatic warehousing, including mechanical order picking. Through systems-engineering and equipment available today, not only can warehousing be automated to save much labor and space, but customer service can be considerably improved. The future will see many types of food warehouses shrink in size as production is more closely integrated with distribution. And it will see them become dynamic, or "live" storage systems, instead of static piling operations.

Another key to progress is automatic data processing with electronic equipment. Pace-setting food firms already have put this to work to achieve fast, close control of sales and inventories. It translates a terrifically complicated set of data into simple reports for quick management decisions.

"Impossible" is done right away

An even more shiny key is the electronic computer that solves "impossible" problems. Heinz just bought one. Others are using them for a fee. The computer doesn't think, but properly manipulated it can take a complex of facts that confound the human mind and come up with simple answers to costly problems in processing, marketing, and shipping.

These keys to progress will cost you money. But like process automation, it may well be that you can't afford not to afford them.

You're in Most Significant Industry of All

How much pride do you take in your industry? Less than the situation warrants, in all probability.

Chances are that you, like those who consume your products, take the industry for granted. It is, of course, essential. But let's look beyond that, to what else it is.

Your industry saves housewives many hours and much annoying work every week. It saves labor for the man of the house, too. If efficiency in processing, packaging, and distribution had not been stepped up considerably, the breadwinner would have to work several hours more each week to buy the family's groceries.

Remember, also, the contribution to happier and longer living made by modern foods through good nutritional qualities and safety.

Food sells America to world

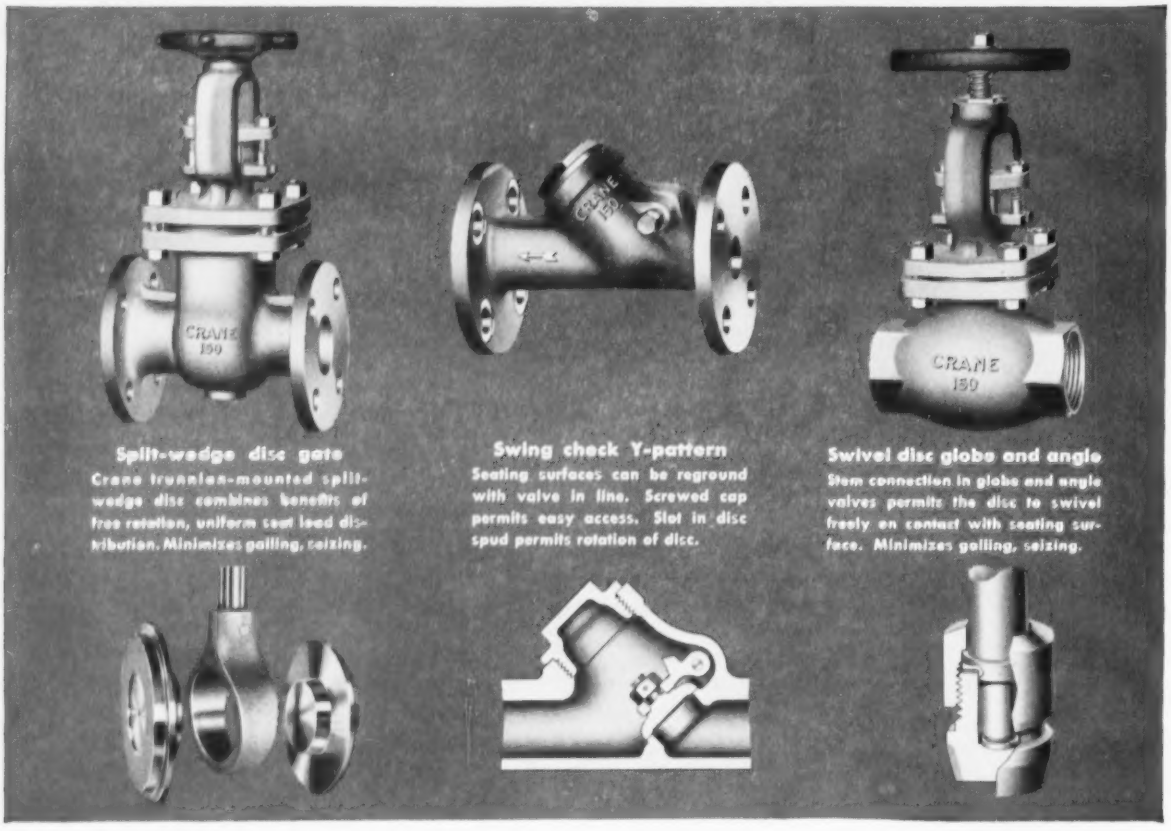
All old stuff? Well, then, are you aware of an important international role now being played by American packaged foods? We're not referring to the export business. We're talking about selling America through the stomachs of people in less fortunate countries.

Your Uncle Sam is entering foreign trade shows now, partly to foster trade, but principally to sell America. One is being held this month in Belgrade.

And what do you think "rings the bell" in the minds and hearts of the millions who see these shows? It's an American supermarket, with four thousand items of tempting packaged foods. When it dawns upon people that all this is commonplace in America, the impact is terrific. They realize what our system really does for the people.

So head up and chest out. You couldn't be in a more significant business!

Cut your piping costs with CRANE corrosion-resistant valves



Split-wedge disc gate
Crane trunnion-mounted split-wedge disc combines benefits of free rotation, uniform seat load distribution. Minimizes galling, seizing.

Swing check Y-pattern
Seating surfaces can be reground with valve in line. Screwed cap permits easy access. Slot in disc spud permits rotation of disc.

Swivel disc globe and angle
Stem connection in globe and angle valves permits the disc to swivel freely on contact with seating surface. Minimizes galling, seizing.

Are your alloy valve replacement costs too high? Do you have trouble preventing product contamination?

Thousands of processors who must handle and control the flow of corrosive fluids in production have solved these problems effectively with Crane alloy valves—18-8 SMo stainless steel and Craneloy 20.

These valves, in addition to providing high resistance to corrosion and protection from product contamination, also have construction and operating features that are unequaled in cutting maintenance and installation costs.

For complete information about Crane alloy valves for processing industries—application recommendations, materials, sizes, ends available, and companion fittings—write to the address below, or ask your Crane Representative.

Send for Circular 2080 today.

CRANE VALVES & FITTINGS

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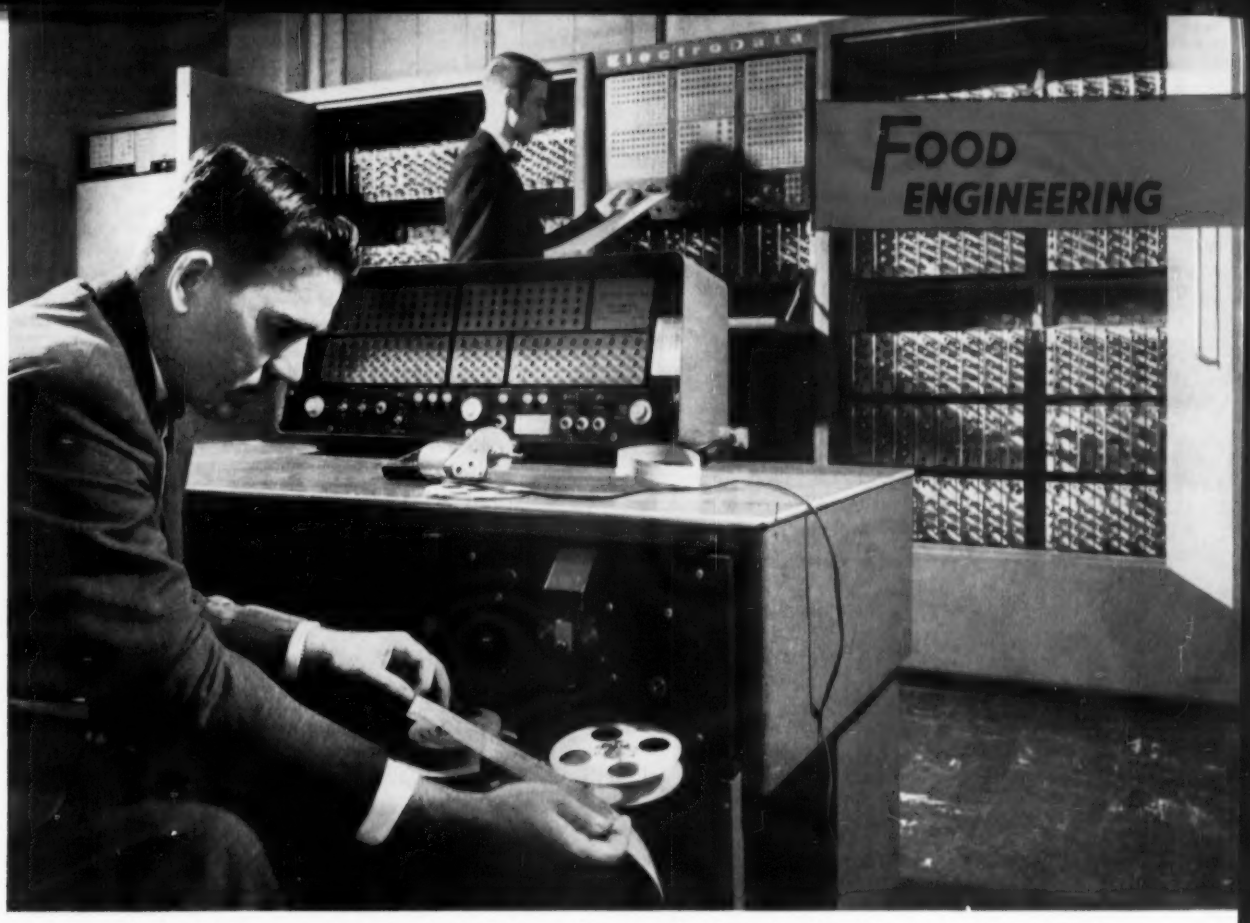


TAPE punched with holes representing data of a food-plant problem is readied by Author French for "reading" into "brain." Solution reached within tube-and-wire complex will be tapped out on automatic typing unit. At main bank (background), Dr. Milton Snodgrass cross-checks for any errors in data feeding in. Operations can be controlled either from console on desk or main panel. Machine is product of ElectroData Div., Burroughs Corp.

Electronic 'Brains' for Food Firms?

Far-fetched? Well, it isn't. For actually the techniques of these calculators open the way to lightning solution of many complex management problems. To name a few: Distribution posers, work-scheduling bafflers, materials handling enigmas . . . And you don't have to buy a machine

CHARLES E. FRENCH

Professor, Agricultural Economics Department,
Purdue University, Lafayette, Ind.

YOU MAY BE ONE of the many who think of an "electronic brain" as that mysterious machine seen on TV on recent national election nights.

You recall it had many flashing lights. Engineers nursed it with maternal diligence. Assistants poured masses of data into it. And the commentators promised that it would give you the winner by 8 o'clock.

Probably you mused, "Fine, I won't miss any sleep. And what's more, this is one commercial where I'm definitely not a target!"

But you may be wrong on that last part. An "electric brain" may be closer than you think.

In this article and the two that are to follow, we hope to show you what this machine can do, how it does it, and how you, as a food man, can take advantage of it.[1] No, we're not trying to sell you a machine. Rather, our prime interest is to tell the story of it to managers who'll never own a machine.

We will reveal how you may solve numerous problems with the machine's method, but without the machine. Then, for the figuring that does require one of the "brains," we will disclose how data are set up so that such a unit can be employed at a nominal cost.

If, as a good-sized organization, you've already got

Tool for the Food-Firm Manager

This is the first of three pointed articles disclosing the broad food-industry potentials of the "electric brain" and its mathematical technique, linear programming.

Prepared by Professor French with the aid of two of his colleagues, Profs. Milton M. Snodgrass and James C. Snyder, these features explore the digital computer's striking problem-solving functions from the practical viewpoint of the food-firm manager—not that of the mathematician, engineer, salesman, or professor.

The plant problems grappled and points thus disclosed stem directly from these experts' specific experience with the "brain" techniques over the last five years.

Watch for the second and third articles in forthcoming issues of FE.—*The Editors*

access to an "electric brain"—or are about to get such access—then you may find some pertinent pointers here for getting more out of it.

"Electric brain" time can now be rented from the major "brain" manufacturers. For most problems of the type we are going to discuss, the cost would be, at most, but a few hundred dollars, and in many cases less than $100. You will get more for your money if you get a grasp of the technique and how the problem should be set up.

Also, the "brain" makers are now realizing that they have been too busy selling the easy market and have not adequately shown the trade how to use these machines. They are now spending huge sums of money to furnish experts to help you in setting up your problems.

The knowledge from these articles should help you take advantage of this.

"Electric Brain" and Mathematics

There is no need to keep it a secret any longer: Yes, we are going to discuss some mathematics. In fact, it is high-powered mathematics. But we will try to make it easy. An "electric brain" and mathematics fit hand-in-glove. Actually, the machine was invented because the mathematicians worked themselves into a paradox. The problems that needed solving were large and complicated. The mathematicians could generally solve them with simple arithmetic. However, computing the arithmetic took so much work nobody could afford to solve the problems this way.

The mathematicians then developed some intricate mathematics which could solve the problems with little work. But this was so complicated that only a very few persons could use it.

Solution was to build an "electric brain"—a unit that does the computations so fast and economically that we can use relatively simple mathematics and not worry about the computing work involved.

The machine turns out computations miraculously quick. For example, one machine is cited as able to add 1,905 pairs of 11-digit numbers in 1 sec. Check your watch and see how long it takes you to add just one such pair, say—

96483257964
Plus 35865979365

Finished? Well it probably took you about 10 sec. for this one pair! Further, this "brain" machine also has a reputation for squaring all numbers from 1 to 1,000 in 3 sec. You need not time yourself on that one. You have the point.

Of course, such lightning calculations mean nothing if the data going into the machine mean nothing—you merely get nonsense quicker! This is not purely a loss in some cases, but the machine likes to get things right, and generally does. Such speed allows many checks and rechecks. Thus, accuracy is really one of the virtues of the machine.

This fact is already written into our legal system.[2] If the machine, after thoroughly rechecking itself, can find no way to get a correct answer, it virtually stops and yells for help. Thus, the makers refuse to use the tradename "Maniac"—though it's often been suggested.

An "electric brain" is not really a brain. And we're glad it isn't. If it had emotions or feelings, we'd tend to question its answers. An "electric brain" is a machine—nothing more, nothing less. As Gen. E. W. Rawling, U. S. Air Force, puts it, "These machines are computers, not compensators."

An "electric brain" is complicated. The famous "Univac" boasts of over 200 miles of wire and 5,400 tubes in addition to 18,000 germanium diode substitute tubes. It has a built-in device that can print the answers in five copies. Also, it can make trademarks and other symbols on surfaces from 4 to 27 in. wide.

Despite this, an "electric brain" is not mystical. It does exactly what man dictates, just as any other machine. The most dramatic example of this came in the 1952 election. "Univac" predicted a landslide 2 hr. after the polls closed. Yet, everybody had expected a close race. The men running "Univac" refused to believe it and proceeded to rationalize its mistake. Hours later they found the mistake was theirs, not "Univac's." As Dr. T. C. Fry of Bell Telephone Laboratories has said, "But for all its prodigious powers, the slave requires an intelligent master."[3]

A machine's virtue lies in the fact that it can handle complicated problems more accurately and much quicker in most cases than can man. But man must tell it how to do the problems. Large repetitive problems are its favorite diet.

You've heard of some of its uses. Let's list just a few: During the war, many military problems were solved. In fact, some think of the famous bombsights of World War II as the first "electric brains." A machine has given us a Bible concordance that classifies each of the 800,000 words in the Bible into 350,000 contexts. A machine handles the reservations for a major airline. Another is aiding a large poultry man in finding his best egg-producing hens.

Machines are being used to plan the crops and livestock for farms. They have determined the lowest cost methods of producing animal feeds,[4] also cheese spreads for humans.[5] A machine selected the most profitable line of products for a milk plant.[6] The best use of seasonal labor was studied in another plant. Which factories should supply which warehouses was easily handled for a national canner.[7]

Basically, the machine performs two tasks: It mechanizes and speeds routine work, such as accounting where many numbers must be handled many times. Also, it can solve management problems put in mathematical terms.

We will primarily concern ourselves with this last task—most specifically with one such type of problem, commonly called linear programming.[8,9,10]

The accounting type of machine application is a

specialized field. It tending to fit larger organizations, it can best be explained and evaluated by experts from computer-making companies.[11] We hasten to add that automatic accounting dovetails with problem analysis, such as linear programming. The two will aid each other and spread high machine costs. Also, many machines exist. And the machines should fit the jobs.

We stress linear programming because we believe it is the most logical and profitable place for smaller food companies to get a toe hold into the potential of the "electric brain." Linear programming actually involves two somewhat different types of problems. We call one the "transportation" problem; the other the "general" problem.[12]

The "Transportation" Problem

In the original problem of this type, the object was to determine the lowest transportation cost for moving supplies from given output points (such as plants) to given consumption points (such as warehouses). The method was developed for such problems as determination of the best convoy schedules for ships in World War II and for the Berlin airlift. Now, the problem has rather wide application and is fairly simple to solve.

Look at our panel titled "Transportation Problem." It shows a simple poser relative to two plants supplying three warehouses. With the given transport costs, from which plants would you supply each warehouse?

Probably you got this one easily. Or did you say, "Let all of Plant A's output go to Warehouse III. We can't pass up that $2 transport rate!"

Actually, this would give you a transport bill of $170 because of the high rate between Plant B and Warehouse I. Having Plant A supply 8 units to Warehouse I and 2 units to Warehouse III would give a bill of only $100.

No, we don't need an "electric brain" to solve this sort of problem. But—what if you had 10 output points and 15 consumption points? In a later article, we will show a technique that will do this one, too, without a machine. However, as these problems get bigger, the machine comes into its own.

You probably have some good problems of this type in mind. Those revolving around distribution-route scheduling, crew scheduling, materials handling, sales area functions, plant location factors, raw material procurement, and the like, seem to fit the pattern.

The "General" Problem

This one gets its name from the fact that it is more "general" than the "transportation" problem. You recall that we specified the output of each plant and the needs of each warehouse. The product from any plant could satisfy the needs of any warehouse.

The simple "general" problem is easily illustrated:

1. We have these fixed items:

a) Coldroom space	10,000 sq. in.
b) Machine capacity	480 min. running time

Such conditions may not be realistic in some problems. Thus, the "general" solution gives us more management elbowroom to describe our problems.

Unfortunately, the "general" problem is more difficult to solve and thus is more likely to require a "brain" for solution. We like to have both procedures in mind so we can use the one that fits.

2. It takes this much of each to produce one unit:

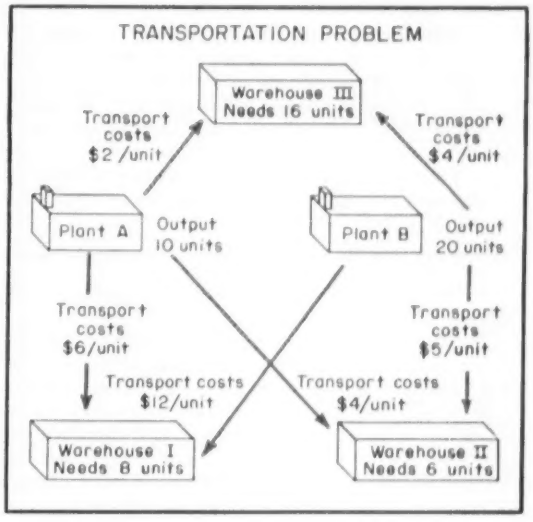
Product	Coldroom Space	Machine Time
a) 1-lb. carton	30 sq. in.	2 min.
b) 2-lb. box	50 sq. in.	5 min.

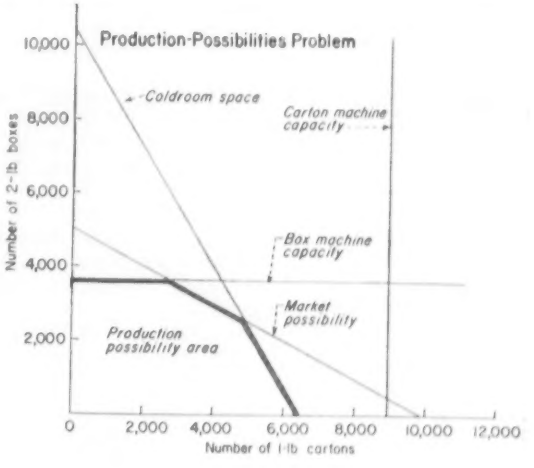
3. Our selling prices, less all costs except a charge for cold room space and machine time, are:

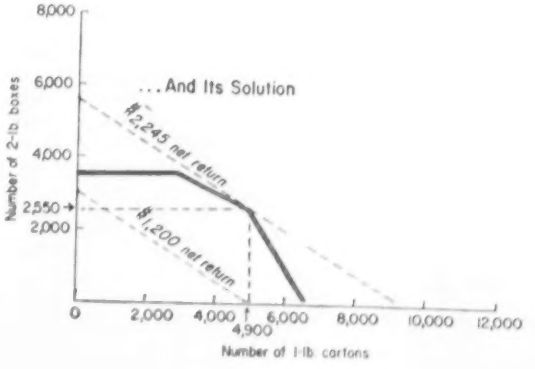
a) 1-lb. carton. . . . 9c. (b) 2-lb. box. . . . 17c

Turn page

Focus on the Question







"Take a Look–Your *Competitor* Will

The "electric brain" employs no magic. Use of it is relatively simple, and it gives practical answers.

But we don't feed it data at random and then expect quality problem solutions–any more than we'd pour food ingredients at random into a mixer and expect a quality product.

Prime point is to understand the unit's methods. In fact, one of them–linear programming–is simple enough to copy, and thus often solve our problems without the "brain."

These machines are part of the trend to automatic operations. And as more operators are trained, and the costs come down, there will be wider use of them. True, many small companies won't be buying them. But since time on these units is already available, along with expert help, such firms needn't hold back.

The "brains" are here. And they do have a future in the food industry. Take a look at them. Your competitor will.–*C.E.F.*

4. We can sell 1,000 lb. of the two together at these prices. Either can substitute for the other.

5. We want to know how much of each of these to produce to get the greatest return considering our fixed resources in coldroom space and machine time.

You look over this data, and then reason as follows: "Well, cartons net me 9¢ per lb and boxes only 8½¢ per lb. So I'll push cartons. The market will take 1,000 cartons. Have I machine time enough to produce this many? No, I can only go up to 240 cartons. This looks like a bottleneck. Would I do better on boxes? No, I can produce only 96 boxes. This would return me only $16.32, whereas 240 cartons would return me $21.60.

So I had better stick to cartons. I know that 240 cartons are the most I can produce. But, maybe I cannot produce even this many. Have I coldroom space enough to handle them? A quick check shows that I have enough to handle 333 cartons. So I'm all right here. Thus, my answer–240 cartons, no boxes."

You solved this in almost the exact way the "electric brain" would. Since it was so simple, it was easy.

But what if we were dealing in 50 products with many resources and selling prices?

In short, let's now take one that's a little harder–to illustrate how quickly they can get complicated.

1. We have these fixed items

a) Coldroom space	52,000 sq. in.
b) Carton machine time	360 min.
c) Box machine time	360 min.

2. It takes this much of each to produce one unit of these products:

	Coldroom Space	Carton Machine Time	Box Machine Time
a) 1-lb. carton	8 sq. in.	.04 min.	(none)
b) 2-lb. box	5 sq. in.	(none)	.10 min.

3. Our selling prices, less all costs except a charge for coldroom space and machine time, are:

a) 1-lb. carton . . . 25c. b) 2-lb. box . . . 40c.

4. We can sell 10,000 lb. of the two together at these prices. Either can substitute for the other.

5. We want to know how much of each to produce to get the greatest return.

This is a bit difficult, so in our accompanying illustration–"Production-Possibilities Problem"–we show it graphically. We know that we have capacity for only 3,600 boxes on the box machine, so let's draw in a line to show that we must not produce more than 3,600 boxes. This line is labeled "Box machine capacity." The carton machine limits us to 9,000 cartons, so we draw that one in as the "Carton machine capacity" line.

Now, we know that the market will take either 10,000 or 5,000 boxes. If we draw a line connecting these, it will show all possible combinations of the two which we would produce and still not go over the 10,000-lb. limit of the market.

For example, one such combination would be 4,000 boxes and 2,000 cartons. We call this the "Market possibility" line. And we have one other factor–coldroom space. We have space for 10,500 boxes or 6,500 cartons. If we draw a line between these points we have all possible combinations which the coldroom can handle. One such combination would be 4,000 boxes and 4,000 cartons. This is the "Coldroom space" line.

Now, you can see that we have a picture of what we can produce–any combination of cartons and boxes below the heavy black line formed by these intersecting lines. The question is, which particular one? That's simple, all we need are the prices.

What are the relationships between our prices? All we need to determine this is to find how many of each we must sell to get a logical net return–say $1,200. We can get that with 4,800 cartons or 3,000 boxes.

Our third illustration, headed "Solution", again shows our area of possible production. On this chart, we draw a line between these two points. Thus we have all of the possible combinations of these products which will give us our return of $1,200. This line is labeled the "$1,200 net return" line.

Now, if we draw a line parallel to this one at the highest point possible and yet touching the heavy line marking out our production possibilities, we can get our answer. Such a line, labeled "$2,245 net return", shows that we should produce 2,250 boxes and 4,900 cartons, for a net return of $2,245.

This technique is a useful one for simple problems involving only two products. But with more than two, you have trouble drawing pictures of them, and need another system. If you remember just a little of your algebra, you can visualize how the "electric brain" handles that. Merely put these ideas into equations.

First, look at the market situation. We said we could sell up to 10,000 lb. Let C stand for the number of cartons sold, B the number of boxes sold, and M the number of pounds of the market not satisfied. Then, we have this market-view equation:

$$C + 2B + M = 10{,}000 \text{ lb.}$$

Next, we add an S to our mathematician's jargon–standing for the square inches of coldroom space unused. Then, this equation says:

$$8C + 5B + S = 52{,}000 \text{ sq. in.}$$

Similarly, let Mc stand for the amount of unused carton machine time, and Mb stand for the amount of unused box machine time. Then use of the carton machine is explained by this equation:

$$.04C + Mc = 360 \text{ min.}$$

Moreover, to explain use of the box machine we have:

$$.10B + Mb = 360 \text{ min.}$$

One more and we have the whole problem ready for the "brain." For maximum return:

$$\$.25C + \$.40B = \text{Maximum dollars}$$

The complete battery of equations is as follows:

$$\begin{aligned} C + 2B + M &= 10{,}000 \\ 8C + 5B + S &= 52{,}000 \\ .04C + Mc &= 360 \\ .10B + Mb &= 360 \\ .25C + .40B &= \text{Maximum} \end{aligned}$$

By solving these for the value of the unknowns (C, B, M, S, Mc, Mb) in such a way that each equation is satisfied, the "brain" gets the same answer we got with the chart. And if you had only two products involved, you would probably use the chart.

However, with equations such as these you can keep adding products and limiting factors and still make sense even though you cannot draw a graph of it.

Problems of this type involve all phases of product line, sales promotion, machine selection, building allocation, raw material purchasing, process selection, and labor use.

Try putting some of your problems into equations as we did above. In the next article we will show you how to solve such problems.

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—*END*

Executive Tells Why

Heinz Readies Univac Program

Computer will go into action on order processing, inventory control, statistics, also payroll, billing, and accounts work in '58

R. BURT GOOKIN

Comptroller, H. J. Heinz Co., Pittsburgh

AN OVERALL computer system, encompassing use of our "Univac," is now being developed by the H. J. Heinz Co. research staff.

The first six applications—in payroll work, order processing, billing, accounts receivable, sales statistics, and inventory control—are scheduled for July 1958.

This initial phase of the program will convert a great mass of operating data to the computer, and will thus set the stage for more advanced use—particularly the sophisticated areas of decision making, planning, and control.

One of today's most persistent and vexing problems is that of achieving an adequate level of coordination—with informed direction—in the complex business structure. The solution lies in carefully planning a system of data processing.

A point to be made clear is that electronic data processing is not an objective in itself, but only the means to improved administrative procedures.

The goal is to organize it on a broad integrated basis—correlating the needs of all interrelated functions and viewing them as a composite whole. Not as separate parts.

This should make available more timely and meaningful information for all managerial posts throughout the entire H. J. Heinz organization.

Our adventure into this field is essentially a long range project. There are substantial benefits to be achieved, but these benefits lie in the future.

The successful application of electronic equipment and techniques requires a substantial investment of time, money, and effort before the benefits may be realized. This is a research point of view—a willingness to invest now as a prepayment for future harvests.

Generally speaking, there appears to be a great deal of misplaced emphasis on electronic computers per se. They have been cloaked with a superficial glamour, which tends to obscure the simple fact that a computer is just a machine—a powerful machine it is true, but, nevertheless, just a machine. —*End*

FOODS OF DISTINCTION, these and the other 52 GF gourmet items, are packaged in simplicity and elegance. Containers and labels were designed to connote food-like cleanliness and enduring quality. A new effect is achieved with "floating" illustrations. Key element in label design is the GF trademark.

GF Pioneers Prestige Line

Why and how hold significance for food industry. Involved are problems in quality control, packaging, marketing, and management

FRANK K. LAWLER
Editor, "Food Engineering"

Why is General Foods pioneering a line of gourmet products?

What does this leader in popular national-brand foods expect to achieve with its fancy, high-priced items?

How is GF geared management-wise to do the job?

And how will the products be produced, quality-controlled, packaged, and marketed?

The answers to these questions are more than interesting. They contain significance to every forward looking executive in the entire food manufacturing field. For GF is about to prove—or disprove—some advanced food marketing concepts. Admittedly the firm is flying somewhat "by the seat of its pants" in an area where its customarily thorough market research and analysis is impossible.

Let's take the development from the beginning.

How It All Started

The idea came more or less out of the blue. An alert vice-president suggested that a food company should have a prestige line. Something to enhance its reputation as the "master of its art." Like the Cadillac or Thunderbird in the automotive line, or Steubenware in glass.

GF's executives liked the idea as one which—to quote President Charles G. Mortimer—"will contribute something to the corporate image they want to build for General Foods in the public mind."

While they believe their gourmet business will always be small, they do in time expect it to contribute modestly to earnings. GF is shooting at a limited market where quality, not price, is the principal sales motivation. Potential profit margins are relatively high and more stable against the forces of competition.

And the higher margins should shorten the distance to the break-even date.

That notwithstanding, GF sees another benefit. It is hopeful that in the gourmet line it will now and then uncover a new product suitable for mass distribution. And 35% of GF's sales last year came from new products.

Picking the Key Men

Having tentatively accepted the idea for introducing the gourmet line, GF had to explore the market potential and other vital facets of fancy foods. To spearhead the work, it hired Joseph V. Starke, general manager of the gourmet operation. He came from Amos Parrish, consultants in department store merchandising, where he was executive vice-president and general manager. He brought with him for his national sales manager, Mr. John T. Webber, also of Amos Parrish.

From General Foods, Ltd., of Canada, came a man with special production know-how. He is Ronald Blench, a Britisher with several years of experience in food processing in Europe.

Then GF utilized the services of its consultant, Robert Kreis. A Swiss chef with famous West Coast experience, Mr. Kreis developed GF's Good Seasons salad dressings.

This team, backed up by GF's management and technical know-how and facilities, was able to investigate all problems and come up with plans and procedures.

Exploring the Unknown

But it wasn't simple. Much had to be done on judgment rather than firm facts. To get the picture of potential volume and types of products that could be in the gourmet line, Mr. Starke traveled the country for months. His mission was to discuss fancy food volume and categories with merchandising managers of department stores selling fancy foods.

Then some interesting statistics were compiled to supplement the department store information. One set of data were figures for fancy food sales. But data from different sources varied considerably. And since the problem was to size up the luxury market, the analysis took into account such non-food factors as sales of swimming pools and foreign sports cars.

Such information, plus the well-documented trend of increased spending for high quality and convenience foods (up 82% in 5 years for a selected list), indicated a market for GF gourmet products.

So the die was cast. But what should the products be? Where were they to be obtained?

MEN RESPONSIBLE for the new GF gourmet operation include J. T. Webber, national sales manager (left) and Joseph Starke, general manager of gourmet operation (top right). They are seen here with an exhibit of their imported and domestic fancy food specialties. Gourmet production manager is R. O. Blench (right).

Search for Items and Sources

These questions took men to Europe. Mr. Starke spent a number of months checking into fancy foods made and sold there. And he contacted and studied the manufacturers.

During his travels, he picked up samples and sent them to New York for testing and evaluation by GF kitchens, and for quality analysis in the laboratory.

Following tentative product and source selections, Mr. Blench and Mr. Kreis also went to Europe. Mr. Blench looked into production and quality control facilities and raw materials supply. Mr. Kreis checked product formulations, and in some instances suggested ways to make them still better.

In all this investigation, one requirement was uppermost. "The items must be the best available."

Another essential is that each product meet Department of Agriculture and Food and Drug Administration requirements.

But that is by no means all. GF set up its own high-level specifications for each item, and made certain that suppliers selected could meet these specs.

Creating the Package

Package designs posed unique problems, too. These would be critical to GF's purposes. There had to be a "family" resemblance and GF brand emphasis. Then that "Cadillac" quality had to be connoted. But let the package designer, Josephine von Miklos, present the packaging philosophy in her own words:

"First important consideration be-

Big Market for Luxury Products

- Almost a million Americans drive Cadillacs—293,500 were sold in '55 and '56.
- 11,516 foreign luxury sports cars were sold in the U.S. in 1956—plus 26,000 Thunderbirds and 7,500 Corvettes.
- Pleasure boating is a $1.3 billion business.
- Residential swimming pools increased from 2,500 in 1947 to 57,000 in 1956.
- Nearly 3 million American families have incomes over $10,000—600,000 have incomes over $15,000—90,000 have incomes over $50,000.
- The "leisure market" is rated at $30 billion to $40 billion a year.
- Americans spend nearly $11 billion a year for pure recreation—$12 billion additional goes for vacation travel.
- 1.5 million Americans will take trips abroad in 1957, *not* including those going to Mexico and Canada.
- In 1956, Americans filled glasses with $45 million worth of champagne; bought $8 million worth of caviar.
- U.S. Camera bugs spend about $400 million a year for photographic supplies and equipment.
- American homes are equipped with 3.6 million air conditioners—36 times the number owned in 1946.
- About 12% of all U. S. families have two-cars.

came the creation of a basic motif which would convey, in a dramatic manner, these ideas: (1) That these foods are of the very best quality; (2) that they are cosmopolitan in character; and (3) that this line was not to be promoted on a wave of fashion today, but would have to have an element of permanent appeal and enduring value. . . .

"The idea of floating ingredients, tools, or utensile over floating shadows has taken the label illustrations out of the realm of the commercial and specific and given them a new dimension.

"International in character and timeless in concept; luxurious in execution and just enough off the ground to create an impression of lightheartedness, the designs carry out the unwritten law that only simplicity means elegance."

Special glass containers of a shape connoting gourmet quality also were developed. These will be made in Europe for the products glass packed there.

Another packaging decision was to adopt for most items cases containing 12 packages, rather than 24, to align numbers with turnover anticipated in stores.

Motivating the Market

Where and how to sell and distribute the gourmet line encompassed another vital area of planning. The line will be retailed only through department stores with successful fancy food operations and through specialty food shops. Stores will be encouraged to use suggested retail prices.

Out of an estimated 5,000 stores that handle gourmet items, GF expects to have its line in 1,200 to 1,500 by the end of the first year. And it hopes its items will be displayed as a "GF family" in the retail stores.

Eleven GF salesmen handling only the gourmet line will sell directly to the retail stores, and some point-of-sale merchandising helps will be developed.

All imported items will be received by GF in New York. But distribution will be from six points at strategic locations about the country (New York, Atlanta, Cincinnati, Chicago, Kansas City, and San Francisco.) This will expedite service to retailers, who will be charged FOB distribution point. In addition to distribution point cities, salesmen will be located in Boston Dallas, and Los Angeles.

Because of the relatively small volume, it is not feasible to handle the gourmet line through the regular distribution centers which have done so much to expedite handling of GF's regular items.

Promotion will involve full-page "sophisticated" advertisements in the New Yorker, *Holiday*, *House & Garden*, *Gourmet*, *Telefood*, and *Sunset* magazines. The ad budget is substantial for the fancy foods field, but small compared to that for Jell-O or Maxwell House.

The line was introduced by a display at a Fancy Food and Confection Show in New York in late August. And a press session for food editors was held.

Organizing for Management

For effective management, Gourmet foods is set up as a separate operation, headed by General Manager Starke. He reports directly to a senior operating vice-president, Mr. G. O. Bailey. This provides the effective type decentralized management GF has for its various product divisions. It substantially delegates responsibility and authority.

As previously indicated, the operation has its own production executive, sales manager, and sales force.

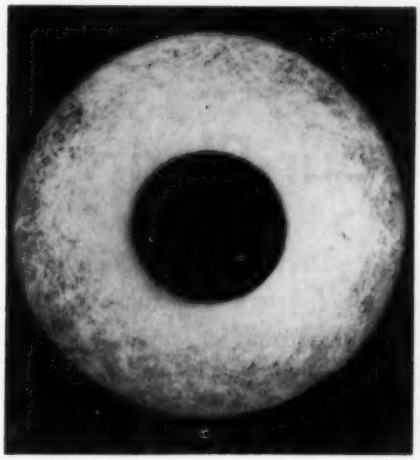
Quality control is handled by a selected team at the Research Center, although these technologists also have other duties.

Management will center in GF's White Plains, N. Y. headquarters, with no foreign offices. Procurement from abroad will be handled and expedited out of the central office.

Offering Good Specialty Line

The initial GF gourmet line includes biscuits and cookies, preserves, soups, sauces, hors d'oeuvres, entrees, coffees, teas, and 8 other individual specialty items. Most will come from abroad—England, Belgium, Denmark, Sweden, France, West Germany, Switzerland, the Caribbean, Japan, and Brazil. But a score will be produced in the United States. Of the latter, GF plants will supply Chili Toasted Coconut, Chocolate Sauce Royale. Breakfast Coffee, Cafe Diable Mix, Assam Tea, Subtle Tea, Wheat Pilaf, Chicken Stock Base, and Beef Stock Base. (See p. 30)

Of the 55 items in the line, 18 are new to the United States, providing a strong novelty appeal and the sales advantage of exclusive products.



NEW FILTER AND HOW IT'S CHANGED. Above: Cross section of cartridge reveals graded density of cellulose fibers—a construction enabling high flow while insuring long life. Right: To change cartridges, operator removes metal housing and lifts dirty cartridge (in his right hand) from spindle, then replaces it with clean one.

Filter Does Better Polishing Job

New cartridge-type unit catches final bits of sediment in beverage water . . . Has long working life, thus saving time, labor, and expense

GEORGE CARLSON
Assistant Superintendent, Beverage Department, First National Stores, Inc., East Hartford, Conn.

PURE WATER of sparkling clarity is a must in many food processing operations—and in none is it more important than in the production of soft drinks.

—For any sediment present in the "soda" detracts from the eye appeal, which is so necessary to sales and acceptance by the buying public.

With this in mind, First National Stores, Inc., recently installed a new cartridge type filter (Cuno Engineering Corp.) at its East Hartford, Conn., bottling plant. And it has already brought the following benefits:

1. **Increased efficiency of the water filtering system.**
2. **Insurance of contamination-free products under all conditions.**
3. **Reduced costs of filter changes.**

These advantages suggest its application to the polishing of various other liquid food products.

Plant Serves Large Area

The East Hartford facility bottles carbonated beverages for distribution through First National Stores located in Connecticut, western Massachusetts, and eastern New York.

To assure uniform high quality in meeting this broad demand, carefully treated water is required.

In the treatment, water is first pumped through sand and gravel filters. Then it goes through an activated carbon unit, for removal of residual chlorine and odors, and finally a paper mesh filter.

Next comes chilling of the water to 34F. by means of a surface cooler, after which it is given a final polishing prior to carbonation.

About 6 months ago, the paper filter employed for this final polish was replaced by a Cuno B-2 Micro-Klean filter—which has proved highly advantageous.

This filter comprises three white cellulose cylindrical cartridges enclosed in a removable metal housing. Because of their graded-density construction, the cartridges remove all particles up to 5 microns in size, also a large percentage of those measuring 1 micron or less.

Cartridges are quickly and easily replaced by removing the housing (see phot

With the previous system, it was necessary to change filter papers every other day—an operation requiring 13-15 min. Also, there was always the possibility of a break in the paper, requiring a complete shutdown of the bottling line, with idling of its crew for approximately ½ hr.

But with the new unit, cartridges are changed only about twice a month—and then it's merely a 6-min. operation. Further, there's never a worry about a breakdown.

What to Expect, What to Do—

When FDA Inspects Your Plant

With its budget at an all-time high, FDA is scrutinizing the sanitation of more food establishments than ever before. Here are expert tips on how the inspector operates, and what he is looking for—accenting preventive measures that will insure you against citations

FIRST OF TWO SPECIAL ARTICLES*

RAY MILLARD
Executive Director, J. Carl Dawson & Assoc., St. Louis

"FDA INSPECTORS? Well, if *they* were all that was worrying me to keep on my toes sanitation-wise, then I could be getting away with murder! Why, I haven't seen one in years."

—This blunt comment caught our ear when we listened in on a recent sanitation shop-talk session of several highly respected food processors.

That the speaker really meant no disrespect was evident. His own plant's sanitation program is exemplary. He was just implying that there are other motives, aside from fear of FDA inspectors, for maintaining a high sanitation level.

He's a man who knows that good employee morale, favorable public opinion, a salable product, and a clear conscience all go hand in hand with good sanitation.

Where he did err, however, was in repeating the false notion that the possibility of an FDA visit is remote.

With the largest budget in its history, an increased staff, and a mandate to intensify its enforcement, FDA has actually made more inspections in the past 18 months than in any comparable period.

So—there's much more likelihood today of your plant being paid such a visit. And that likelihood can be highly augmented if—

- A previous check has gotten your plant into a citation hearing or court action.
- FDA sets out to check a public complaint concerning your product.
- A sample of your food has been picked up in interstate commerce and found to be contaminated.
- A routine sampling of your segment of the food industry has been undertaken.

Ounce of Prevention

Since an inspector may appear at any time, the only way to be prepared for him is to maintain a high level of sanitation 365 days a year.

The alternative may be your facing of a citation hearing, which could lead to court action. Then, should such action go against you, a fine, imprisonment, damaging publicity, and business losses could follow.

Further, shipments of your product considered to be in violation could be seized at time of inspection and later destroyed should a conviction be obtained.

Prior to visiting your plant, the FDA inspector will obtain from his station files all the background available on your plant and its products. In short, he will make moves to know something about you, and, similarly, it would be a good idea for you to learn a little about him.

Your inspector is a sincere, conscientious civil servant dedicated to protecting the public from contaminated food. He probably has a college degree in some branch of biology.

You can expect him to come to the front door of your plant. He'll greet the person in charge with dignity, cordiality, and authority.

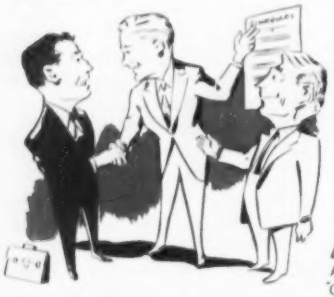
His authority is contained in the Food, Drug & Cosmetic Act, Section 704 authorizing him to enter and inspect your factory, warehouse, or transportation vehicles.

Section 703 provides for access to your records. Although Section 301 prohibits you, the owner, from refusing to permit entry for inspection, the law does specify that entry, inspection, and examination of your records be made at reasonable times.

What He Looks For

Though the inspector may not be acquainted with details of your proc-

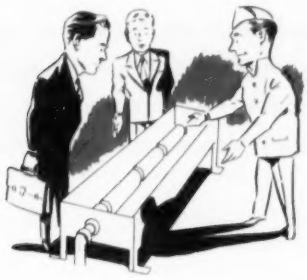
MAKE THE INSPECTOR WELCOME AS MANAGER, TELL HIM ABOUT YOUR SANITATION, ESPECIALLY YOUR ROUTINES



DON'T GET FLUSTERED OR SHOW ALARM... ANOTHER THING: DON'T TRY TO "GUIDE" HIM OR OTHERWISE INFLUENCE HIM

*Do's and don'ts in event FDA cites your plant will be covered in Mr. Millard's concluding article, to appear in a forthcoming issue.

COOPERATE WITH HIM THROUGHOUT HIS TOUR. HAVE YOUR SANITARIAN ALONG TO ANSWER PERTINENT QUESTIONS



DON'T STAND ALOOF... YOU CAN GAIN FROM HIS COMMENTS, WHICH YOU SHOULD CAREFULLY RECORD.

essing, he is a trained sanitarian and definitely knows how to look for dirt. Most pertinent, he will be looking for violations of Section 402, (a) (4), which states: "A food shall be deemed to be adulterated if it has been prepared, packed, or held under insanitary conditions whereby it *may have* become contaminated with filth, or whereby it *may have been* rendered injurious to health."

Specifically, the inspector will be checking for:

1. Rodent excreta and other signs that rats and mice are on the premises—gnawed boards or bags, holes in baseboards and walls, tracks and greasy paths that are usually left by rodents.

2. Poor employee work habits that could lead to product contamination —lack of good personal hygiene, improper attire, carelessness, and inadequate supervision.

3. Insect tracks, webbing, cast-off skins, pellets, egg capsules (such as those dropped by roaches), and infestations in raw materials.

4. Dirty and insanitary utensils and equipment.

5. Inadequate personnel facilities —specifically restrooms (noting if "Wash Hands" signs are posted, and if soap and clean towels are available), dressing rooms, and lunch rooms.

6. Poor waste and rubbish disposal. Eyed here are conditions of sanitary sewers and floor drains, with checks for possible overhead leakage. Also observed are methods for handling plant waste to avoid product contamination and to prevent conditions that are attractive to flies and rodents.

7. Faulty building construction that permits entry of pests; lack of screens to keep out flying insects; failure to proof doors, eaves, etc., against birds, rodents, and other pests.

In the performance of his duties, the inspector will probably check the inside portions of processing equipment, open any materials-handling elevators and conveyors, look into ingredient containers, and examine any other location he believes might reveal evidence of contamination.

He may take samples of your raw materials, finished products, and various labels. In addition, labels of coal-tar colors, artificial flavors, and enrichment tables may be perused.

He may also take photos or make drawings of existing insanitary conditions, and use black light to check for evidence of rodent urine stains on bags or equipment.

Also observed will be your product-scaling operations, as well as weighing and mixing of raw ingredients.

Right Down the Line

In fact, each step of your manufacturing will come under his scrutiny—purchasing, receiving and storage of raw materials, various processing stages, and packaging of your final product.

He will evaluate all insanitary conditions or unsatisfactory practices to determine their individual and total effect on your end-product quality.

By all means, brief all members of top management on what to do when the inspector arrives. This will avoid alarm and consternation should he appear at a time when those most familiar with the plant's sanitation program are absent.

Cooperate With Him

Here are seven fundamental things to do:

1. Welcome the inspector. Offer your cooperation. Let him know you have nothing to hide. Don't try to guide him, entertain him, or offer him gifts. He is trained to avoid any such shallow attempts to influence him.

2. Sit down with him before the inspection begins and freely discuss the details of your sanitation program.

Tell him about your inspection procedures. Describe your purchasing policies and the safeguards you employ to insure purity of raw materials.

Explain your rodent-control program. Point out the extensiveness and frequency of cleaning operations. Produce records to prove your claims.

Then, during the inspection, point out concrete examples of your efforts to achieve a high level of sanitation.

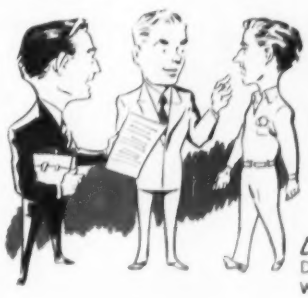
3. You, or some responsible individual in management, should stay with the inspector the entire time he is in your plant.

Ideally, two management representatives should accompany him, one being the plant sanitarian. In this way, you will be able to point out details of your sanitation program as the inspection progresses—thus benefitting fully from comments that the inspector may make.

4. Ask the inspector to direct all his questions to these management representatives. They are fully in-

(Turn to page 124)

ACCEPT HIS EXPERT SUGGESTIONS. HAVE ANY LISTED OBJECTIONABLE PRACTICES CORRECTED.



DON'T IGNORE HIS FINDINGS... ACT DIRECTLY ON THEM — FOR NEGLECT WILL INVITE A CITATION

FLUTED CUPS give impulse-buying boost to spreads.

COMPARTMENTED tray has functional foil overwrap.

HEMMED PAN and window carton packs top pull.

Gaging the Boom

Here's a roundup report for busy food men on fast-moving developments in aluminum containers—packages that hit a new high in appearance, convenience, and performance

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

THERE'S A GROWING SPARKLE in both retail display cases and in the eyes of food men as today's consumers reach more and more for products packaged in the rigid aluminum-foil containers.

Last year, over one-billion units crossed the counter. And industry experts predict that the food container market—which swallowed 40,000,000 lb. of aluminum foil in '55—will gulp down 90,000,000 lb. by 1960.

The reasons are simple:

For her money, the housewife takes home an easy-to-open convenience package that doubles as both cooking pan and serving dish—and sometimes even contains features she can't find in her own kitchen utensils.

For sales-conscious processors, foil offers a sparkling "billboard" that draws the impulse buyer like a magnet. New printing and converting techniques have sharpened this impact. And improved manufacturing techniques and speedier closing machines have cut overall packaging costs to narrow the competitive gap.

Because of this trend, food applications—hitherto concentrated mainly in bakery, meat, dairy, and specialty foods—are broadening. And new uses are moving at a gallop from development labs to the production stage.

Indeed, foil packages should get great credit for the present consumer swing to frozen, prepared foods. Backing up this statement, a recent marketing survey shows that utilization of foil is shifting from bakery goods (a long-time leader) to the new convenience meals.

In early '55, bakery pans took 45% of foil container output, frozen specialties (pot pies, casseroles, etc.) about 40%, and frozen dinners 15%.

Now, however, frozen specialties have risen to 45%, bakery pans are down to 30%, frozen dinners have dropped to 10%, and other food applications (mainly dairy and refrigerated products) have risen to 15%.

All of this activity in rigid-foil packaging is basically keyed to three factors—appearance, convenience, and performance. First, let's take a close look at aluminum's . . .

No. 1 Asset—Consumer Appeal

Foil containers command top consumer interest. In fact, some of the gleaming packages have reportedly increased sales up to 300%—without special advertising campaigns. And even greater impact is given these containers by new cover materials, such as solid foil and biaxially oriented polystyrene.

The recent introduction of colored foils has already

In Rigid-Foil Packaging

opened up further packaging possibilities. They can now be brilliantly imprinted by full-color gravure or two- and three-color flexographic processes.

Key to these printing techniques are new transparent and opaque inks—transparent ones that allow the brilliance of foil to show through, opaque coatings to set off recipe panels, instructions, and additional printed copy.

By using both opaque and transparent inks, the processor can get a vast variety of sparkling color combinations to help solve complex design problems.

Transparent lacquers, too, are now applied in solid colors to enhance merchandising appeal. They are rapidly being adopted for premium specialty products.

Because of these colorful containers—and new developments in package structure—it's no longer necessary, in many cases, for food packers to use printed covers, cartons, or overwraps.

Look for foil containers to take over an increasing role as a complete package for cakes, frozen pies, and specialty items. This trend is particularly evident with the recent development of a rigid foil cover that eliminates the need for an outer carton.

However, both transparent covers and overwraps will continue to be used to "window display" some products.

Another new development in foil packaging is plain or vinyl-coated fluted cups—available in a rainbow array of glittering metallic colors, and in 4-, 8-, 12-, and 18-oz. sizes.

These containers really stand out in refrigerated or freezer display cases. And their impulse sales effect has been outstanding. For example, switching a plum pudding to the fluted package, with no special promotion, boosted sales 380% for one baker.

Convenience—Prime Advantage

The most important convenience feature of rigid aluminum containers is that the food can be heated and served directly in the package—eliminating the use of kitchen pots and pans.

Here are some of the hottest new developments in foil containers, and how they save on housework:

▶ **Foil baking pans,** included in a packaged cake mix, enable quick preparation of a two-layer cake. The package also contains a carton that doubles as a shaker for mixing.

▶ **Gold-colored "oven fryer",** used for a frozen, breaded chicken, doubles as both cooking pan and table server. The container has a waxed color-printed paperboard lid that is removed before placing the pan in the oven. A piece of foil, that comes in the package, is used to cover the pan during cooking.

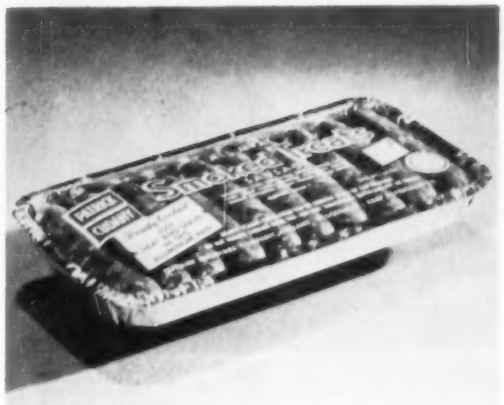
▶ **Tear-strip pan** (Mylar laminated to aluminum foil) provides a simple, instant-opening package for frozen foods.

▶ **Foil tray,** combined with paperboard folder having an acetate window, gives functional display to frozen baked potatoes.

▶ **Rigid-bottom pan** with polystyrene lid is now in use for brown-'n-serve sausages and frozen fishsticks. It permits drainage of excess fat during cooking and speeds browning without the necessity of turning the sausages.

▶ **Hinged, compartmented aluminum tray** for a fish

WINDOW CLOSURE boosts marketing impact.



TRANSPARENT LID on grooved pan has sight appeal.

TEAR TAPE provides quick, convenient opening.

DISK-CAPPED pan doubles as server for baked goods.

READY-TO-MIX foods contain pans for baking.

POP-IN-THE-OVEN pans now have heat-proof covers.

dinner holds two fish fillets, whipped potatoes, and peas. Being folded before packing into a carton, this ingenious design saves about half the display-case space occupied by conventional TV-type trays.

▶ **"Double boiler"** for corned beef comprises outer foil pan (holding 4 oz. of water), a perforated insert for the meat, and a foil lid. Housewife heats the beef in minutes, right on a range burner.

▶ **Multiple pack** incorporates four tray-packed frozen fruit pies, enclosed in a partitioned carton with printed foil overwrap.

▶ **Fluted foil cups** (4 oz.), with foil-paper board disk-caps (sealed with wax), are being employed to market cheese spreads.

▶ **Single-seal aluminum cans** close hermetically to give full protection against leakage and spoilage. These square, colored containers are now being used to pack smoked, sliced lox and Nova Scotia salmon.

Finally, though processors and manufacturers alike are soft-pedaling it, there are the re-use values of the rigid aluminum packages—definite secondary advantages.

They can be used for home freezer storage, reheating and baking foods, molding salads and desserts, feeding pets, and many other indoor and outdoor functions.

Performance Vital to Packers

Foil containers are becoming increasingly adaptable to the processors' automatic production lines. They now handle very well on standard filling, cartoning, and overwrapping machines.

Improved models run smoothly through continuous closing machines that operate at speeds up to 45 containers per minute.

Temper of the aluminum foil used in the packages is now varied from soft to hard—depending on the severity of the forming operation. Deep containers are stamped from soft metal, because it permits greater elongation.

Workability is decreased, of course, with hard temper metals, but the containers are stronger.

Generally, round containers and square or rectangular ones up to 1½-in. deep are made from hard-temper aluminum. Packages deeper than 1½ in. use soft or (more generally) intermediate tempers. Dead soft metal goes into containers with heavy embossing and compartments, like TV-type trays.

Container gages range from 0.002 to 0.012 in. Gages below 0.004, however, can't be used for large, round, or rectangular pans because of a lack of rigidity.

Considered in determining the gage is the extent to which the containers will be subject to hard treatment in food-plant production. For instance, there are the repeated impacts that pie plates take in pie-making equipment, ovens, portable racks, packaging stations, and shipment.

Gage tolerance is emphasized in making foil containers, because non-uniform containers cannot be handled efficiently in food-production lines.

Coatings are applied to foil when it requires protection from certain oil-, salt-, or acid-containing foods. Vinyl is principally used for this purpose.

In most cases, foil containers are resistant to corrosion. Credited here are aluminum's properties in general, and the fact that a thin, transparent coating of aluminum oxide rapidly forms on the surface of the metal when it is exposed to air.

Another thing: Foil packages do not impart a metallic odor or flavor to foods. And in the event that the food product does attack the metal, the corrosion prod-

ucts are invariably colorless, tasteless, and non-toxic.

There is a wide variety of food items that can be packed in non-coated foil. Included are most vegetables, bakery goods, pot pies, citrus fruits, tomatoes, cranberries, and cherries.

Those foods needing vinyl-coated containers are strawberries, pears, raspberries, peaches, apple and cranberry sauces, green beans, cheese and pound cakes, Chinese and Mexican foods, and mushrooms.

Mayonnaise and salad dressing, however, should not be packed in foil containers regardless of whether they are coated or not.

Infinite Variety Now Available

Today, there are hundreds of foil containers in a variety of sizes, shapes, and gages that can be closed with a wide choice of covers.

Patty pans with full-curl rims, made from thin hard-temper aluminum, are stronger and cheaper. Pie plates, also with full-curl rims, are pre-greased, vinyl-coated, lanced, perforated, and embossed by the manufacturers.

Recently, seamless foil plates have been further strengthened by fluting—a new technique that employs controlled "wrinkling" or corrugation of the plate sides.

A foil tube-pan design has been recently fabricated for fruit cakes and similar foods.

And the parade of aluminum containers continues:

- There are seamless square and oblong packages with finished curl rims for a host of foods. Lengths, widths, and depths vary over a wide range.
- Seamless oblong containers with vertical flange rims, designed to take a range of flat, rigid covers and to stack well in display cases.
- Seamless round cups (with curl rims) in several sizes—used with friction-fit or flat-hood covers.
- Seamless, round pizza pans with full curl and other rim styles in many sizes.
- Seamless compartmented trays (round and oblong) for TV-type dinners, with section-shapes and depths tailor-made for different kinds of meals.
- Folded-end containers with hemmed rims and leak-proof wrap-around corners. Ends are made by a variation of the paper-box fabricating technique.
- Brand-new ridged-bottom containers.
- Fluted cups for cheese spreads, wedge-shaped containers for cheese and spreads, half-pie plates for individual servings, and scalloped dishes for small-portion delicacies.

Flexibility in Rims, Closures

There are three types of rims for aluminum containers—full curl, hemmed, and vertical and horizontal flanged.

- **Full curl rims** add strength and rigidity to a container, and assure protection during packing, shipping, and merchandising. Packaging is completed on many types of automatic machines by applying cartons, overwraps, or flat hood covers that are crimped around the curl. Appearance of the curled rim enhances the container, making it suitable for a serving dish.
- **Smooth, hemmed rims** on fold-end containers that have straight even sides permit handling on high-speed overwrap machines without use of adapters.
- **Vertical flange rims** are machine crimped over the cover to give a tight closure. The stiff cover adds to package strength.
- **Horizontal flange rims** take hood-type covers that are crimped around the flange. Disk covers can also be used with these rims, and are heat-sealed to form a liquid-tight closure.

Now, what about covers? Basically, there are three styles—disk, raised hood, and skirted hood.

- **Disk covers** are made from plain, bleached sulfite board, foil or film laminated board, plastic or wax coated board, solid foil, or transparent plastics such as polystyrene. Some disk covers are even made with cellophane or Pliofilm windows.

The foil covers come plain or gravure-printed in gages ranging from 0.0020 to 0.0045 in. And they afford the product maximum top-to-bottom foil protection.

Polystyrene lids offer complete product visibility, and they can be printed. Also, the material is dimensionally stable at both high and low temperatures—making it very suitable for frozen foods.

- **Flat hood covers** come in solid or mounted foil models for full-curl or horizontal flange containers.
- **Raised hood covers** take over for products that cover the flange or rise above the top of the container.

Along with the development of better containers, there has been a steady improvement in closing machines. This advance has proceeded in steps—from hand- and foot-operated units to semi-automatic hand-fed machines and most recently to a new automatic device that shuttle-feeds up to 1,500 containers per hour.

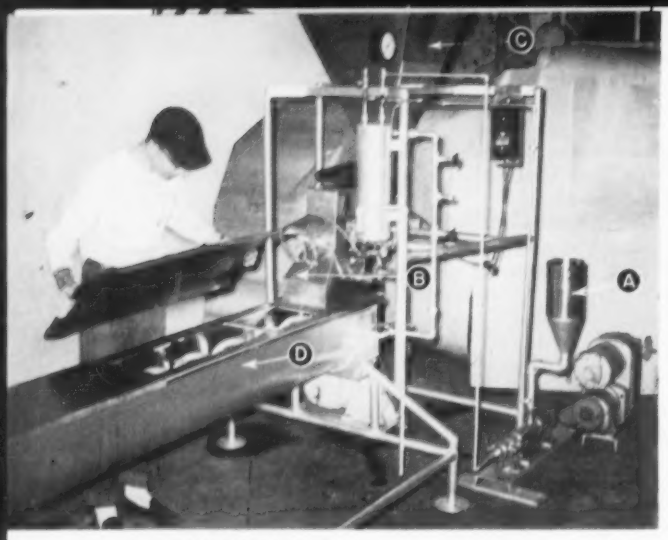
Undoubtedly, there will be further advances in closing units for all types of foil packages, bringing savings on costly hand labor.

So look for higher-speed equipment, automatic cover feeds, machine crimping of containers, and better seals in the near future.

And there may be activity in high-speed end-sealing overwrappers that can be used with seamless full-curl containers. Processors could then effectively employ the added strength advantages of this particular type of container.

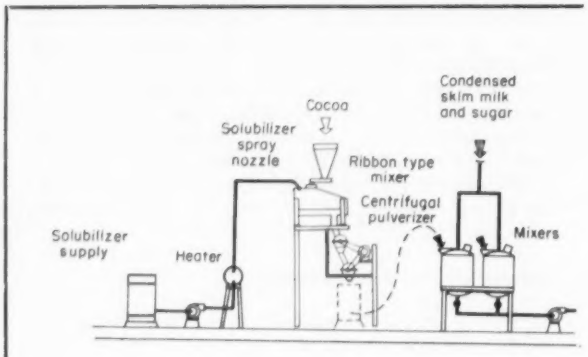
FE gratefully acknowledges the help it received in the preparation of this report from: Basca Mfg. Co., Indianapolis; Cochrane Foil Co., Louisville; Ekco-Alcoa Containers, Inc., Wheeling, Ill.; Kaiser Aluminum & Chemical Corp., Chicago; and Reynolds Metals Co., Louisville.

EXPERIMENTAL package cuts fuss in cooking macaroni.



1 SOLUBILIZER: Here wetting agent is pumped from supply hopper (A) through heater, and is atomized (B) onto cocoa fed from hopper (C). Powder then drops into screw conveyor (D), then goes to double mill (not shown) for final blending.

"Blueprint" of Powder



1

Two New Units Streamline "INSTANT FOOD" PROCESSING

One jet-agglomerates materials into quick-wetting particles, while other atomizes wetting agent onto product. Resulting food powders dissolve fast and completely . . . numerous applications seen for near future

ELLIS G. THOMPSON and JOHN V. ZIEMBA

Respectively, Design Engineer, Specialty Products, Blaw-Knox Co., Mora, Minn., and Associate Editor, "Food Engineering".....

STRIKING ADVANCES continue on the solubility front.

In short, the nation's housewives are now favored with very easily dissolved dry mixes—a far cry from the old slowly soluble, or only partly soluble, powder products.

Here two lately perfected plant processing units (Blaw-Knox Corp.) are now playing very significant roles.

First, there's the Instantizer, which gathers power particles into clusters, for subsequent speedy dissolving in water.

Second is the Solubilizer. This unit blends dry ingredients with a special agent having a high affinity for water—thus producing a product that's easily wettable for jiffy reconstitution.

Farmers Co-Operative Creamery Co., Ogilvie, Minn., has already started using the Instantizer for agglomerating spray-dried nonfat milk into an instant powder. And Crystal Dairy Products Co., Remington, Ind., employs the Solubilizer to make easily wettable instant chocolate milk powder and malted milk, baby food cereals, and nonfat milk solids.

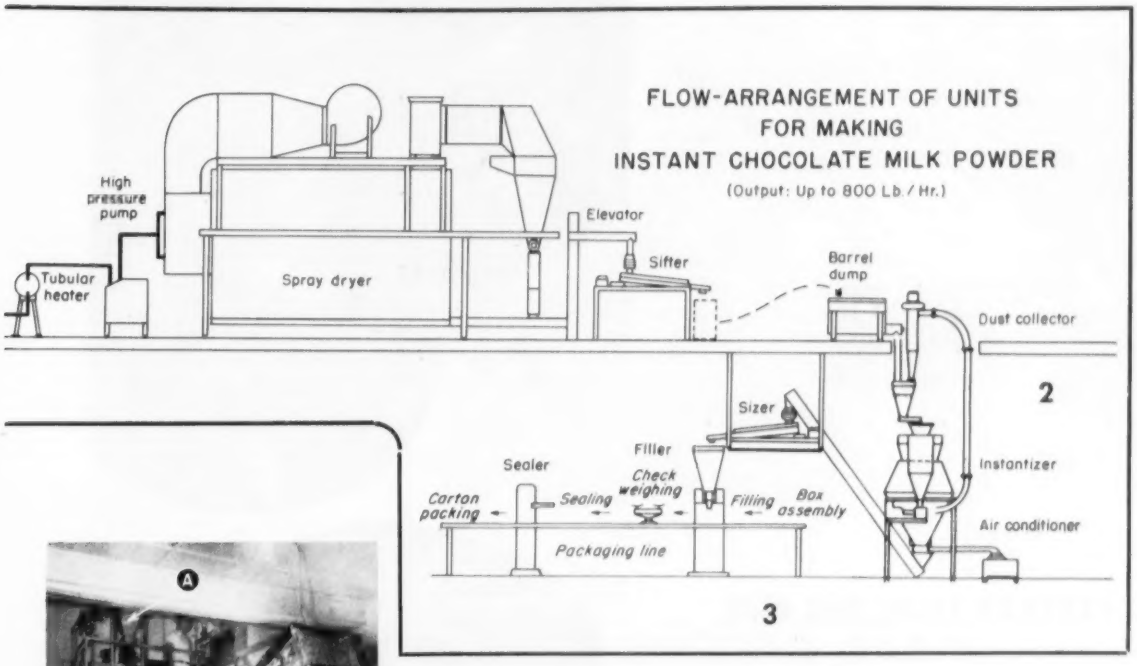
Meanwhile, the list of other such instant products is growing steadily. Using these units, there are specific possibilities for new baby foods and formulas, cake mixes, cereal-type beverages, chocolate fudge, cornstarch, cream, dextrose, egg solids, gelatins, ice creams, pancake mix, potato products, puddings, soups, flavorings and extracts, special flours, soya fats and protein, whey, yeast, and stabilizers. Further applications with beverages like coffee and tea are also seen.

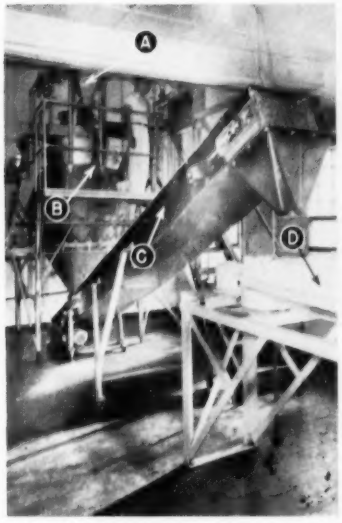
How Nonfat Milk Is Treated

At Farmers' skim milk is concentrated to 40% solids in a double-effect evaporator (Blaw-Knox). Heating from 120 to 160F. follows in a tubular heat exchanger. Concentrate is then charged into a 100-gal. surge tank supplying a high-pressure (3,000 psi) pump. This feeds a gas-fired spray dryer (Blaw-Knox) to produce about 800 lb. of solids (3.5% moisture) per hr.

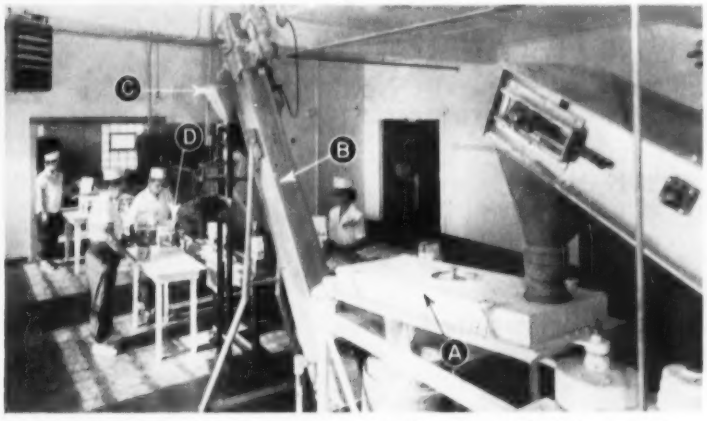
Then powder is charged into the stainless steel Instantizer. Used here is a 400-lb.-capacity stainless barrel-dump with bottom-mounted worm-screw (6-in. dia.) feeding an 18-ft.

Production Line *(Photos Key to Diagram)*





2 **INSTANTIZER:** After blending treated cocoa powder with condensed skim milk and sugar, mix is spray-dried. Then blend is hopper-fed (A) into Instantizer (B). Agglomerated powder is conveyed (C) to gyratory sifter (D).



3 **PACKAGING:** Finished product is sifted (A) to desired bulk density and conveyed (B) to hopper (C) of single-spout filler. Bag liner is sealed (D), and closed cartons are then packed into shipping cases.

bucket elevator. From here a 5-ft. extension screw moves solids to an automatic feed hopper (100-lb. capacity) equipped with level controls. The hopper is mounted over a vibrating-trough feeder that flares powder into a thin stream as it enters the chamber of the cone-shaped Instantizer at 800 lb./hr.

The stream of powder (at 70F.) is surface-moistened by falling between a pair of agglomerating steam jets (6-8 psi.). Solids continue to drop through a heated (240-280F.) filtered air stream. The turbulent air action accomplishes two things: (1) Agglomerates and forms powder into clusters, and (2) removes the moisture picked up from the steam jets. Exhausted material (under 1%) is removed by a 10-in. fan and fed into a cyclone collector.

Agglomerated powder (3.8% moisture) is discharged to a 1¼x17 ft. inclined belt, which conveys it to a gyrating sifter (No. 10 mesh screens). Here product is sized to desired bulk density (35g. per 100 cc.) and readied for packaging.

Another inclined belt (¼x14 ft.) elevates powder into the hopper of a single-spout filler (Weigh-Right). Powder is filled into 2-lb. cartons with foil-paper laminated liners. These are sealed with a Doughboy unit. Then the cartons are packed a

freshly

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and preserved

in their hearty,

natural firmness

by the

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of corrugated cases–

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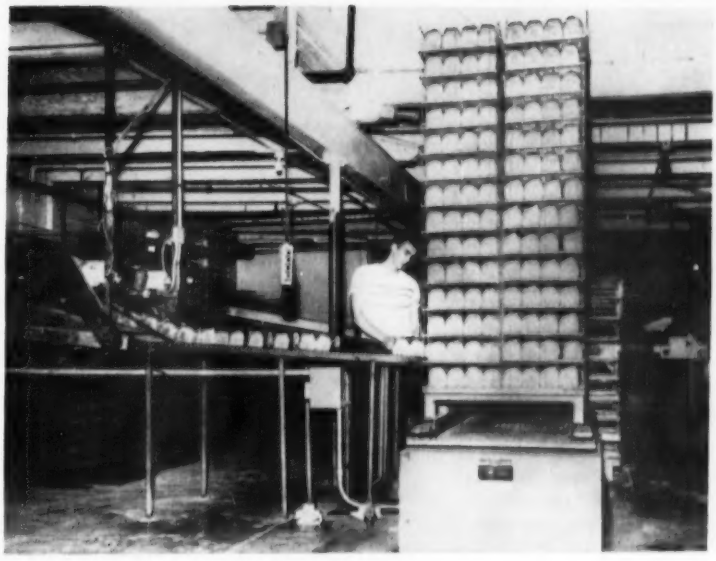


FOCUS ON AUTOMATIC PALLETIZING. Loaves belt-conveyed from slicing-wrapping units are fed in groups of four into baskets stacked on pallet. Latter rests on roller tracks fitted atop platform, which may be moved up and down on its supporting column that travels vertically in 8-ft. pit. Thus baskets are mechanically indexed, one layer at a time, to level of bread-discharge conveyor. After half of pallet is loaded, unit is rotated for loading of other half. Finally, column is leveled with floor to roll off pallet. Carried are 64 baskets holding from 512 to 640 loaves.

Loading Devices, Freezing Plan

Win Efficiency-Plus

Bread slides directly into special wire baskets which are automatically palletized. Loads are then immediately delivered or moved into refrigerated storage against future needs . . . Baskets handle sweet goods, too

FE STAFF

FASTER HANDLING through mechanized loading of palletized baskets gets the No. 1 credit for a highly successful food-plant cost-reduction project engineered in the Midwest.

And working directly with this quicker-handling system is an astute freezing operation that likewise is paying off very handsomely by balancing the weekly work loads.

Omar, Inc., of Omaha is the organization that has switched to this newly efficient working plan.

The bulk of its bread is now mechanically loaded on 4-way-entry pallets each containing four stacks of receiving baskets, 16 to a stack. The pallets are of 10-, 14-, and 16-gage steel, each measuring 6x43x52½ in.

This pallet-handling system was specially engineered for mechanical loading of high-volume white breads into wire baskets.

To run the machine, the operator actuates a motor-driven, floor-level roller conveyor and pneumatically operated turntable. Thus, he feeds, at floor level, each pallet load of empty baskets onto the loader's electrically controlled and hydraulically operated platform (3½x4½ ft.).

Each pallet load is brought to rest on a pair of roller tracks on the platform, which is fitted atop a bearing-mounted column that travels vertically in an 8-ft. pit.

The operator then presses a push-button that lowers the platform so that top baskets are aligned with the bread-discharge conveyor. As each basket is loaded, he operates a foot pedal that automatically starts a 5-hp. motor to raise the next row of baskets to the level of the bread conveyor.

This cycle is repeated until half of the pallet is loaded with bread. At this point, the platform is in top position. He then pushes a "rotate" button that first causes elevation of the loader to clear the bread conveyor, then rotates it 180 deg. and automatically returns it to level position with baskets in line with conveyor. The same sequence is followed until all 64 baskets are loaded.

When all are filled, he operates the floor-level button so bread loader returns pallet load to floor and in proper alignment with gravity rollers

(set in floor and also on independently operated turntable) for discharge onto the roller conveyor that feeds to either the freezer or outbound trucks.

When a load arrives by truck-trailer at a branch, a receiving clerk unloads with an automatic pallet truck.

Not only is his job easier, but he makes only 18 trips (instead of the former 76) to unload a full trailer.

Branch route trucks are efficiently loaded with the baskets of bread. And upon returning from their routes, salesmen load their empty baskets onto pallets for return trailer-delivery to the bakery.

To handle variety breads efficiently, a fast manual pallet-loading system was devised for the company's Columbus, Ohio, bakery.

The breads are conveyed between the two rows of five 68-in.-dia. metal turntables that are flush with the floor.

With loaves coming from slicer-wrappers at a rate of 152 per min., each operator picks off four at a time (or 38 per min.) with an aluminum scoop (flared at end) and loads them into palletized baskets on the turntables. Working off sales orders, they may sort two to six of the dozen varieties to a pallet load from a turntable and then transfer the load into a waiting truck-trailer.

It is this more efficient operation that relieves shipping-room clerks of three out of four of the former trips from bread-discharge conveyors to trucks.

Big Stride Through Freezing

The wire baskets for in-plant handling and route-truck deliveries are company designed. They are constructed to hold eight 1¼-lb., ten 1¼-lb., or twelve 1-lb. loaves with ¾-in. headspace and, by simple insertion of a wire tray, to handle two layers of sweet goods (12 cartons). They permit efficient air circulation during freezing and defrosting operations.

Goods coming off discharge-conveyors slide directly into these baskets through their open sides. Thus, excessive handling is obviated. And the goods are carried in a manner preventing crushing and damaging of packages.

Some pallet loads are systematically transferred to the freezer. And this feature of the operation is a prime factor in the streamlining of the bakery operations.

It has particularly helped toward elimination of downtime due to setting up lines for repetitive runs on low-volume items, like pullman bread and certain rolls.

Formerly, such lines were set up six times weekly. And it took some 15 min. to get them operating.

But with the new system, a single run on these lines produces the entire week's requirements.

In short, after the current day's goods are turned out and put through for delivery the run is continued until enough products are made to cover the requirements of the following five days. This additional production goes into the freezer, from where it is withdrawn and delivered as needed.

Use of the freezer for holding finished goods has won notable advantages for Omar. It has enabled a balancing of its weekly work loads.

Thus avoided is the former condition where early week work loads were light, yet still required the guaranteed pay. And abolished is the need for overtime work at the weekends with its attendant necessity of calling in relief workers and foremen.

For example, an entire department—like the cake shop—can operate on a 5-day-week basis. Now this shop produces, on each of these days, more than the required output, with the additional goods being accumulated in the freezer to take care of orders for the other two days.

Further, the frozen-basis operation considerably simplifies matters when there are calls for exchanges of products between bakeries.

THERE'S BALANCING of weekly work loads by routing daily overproduction into freezer storage. As needed, these stocks are properly rotated out of freezer and into defrost room (above). Then they're delivered.

The 4,200-sq. ft. Omaha freezer holds about 275 pallet loads (four stacks of 16 baskets, or a total of 64). And the company's 7,500-sq. ft. freezer at Milwaukee handles about 500 pallet loads.

Here is a picture of the routine: After coming from the slicing-wrapping machines at 85-90 deg. F., bread is moved in pallet loads into the freezer. Operating the unit at −10F., temperature of the centers of the loaves is reduced to 17F. in about 2½ hr.

Freezers at Milwaukee and Omaha are of the static type, with ceiling-suspended fin coils refrigerated with circulating liquid ammonia refrigerant. Employed at Milwaukee is a 50-hp. York unit developing 18 tons. One of 30 hp. developing 11 tons is used at Omaha.

Milwaukee's L-shaped, basement-located freezing room is cork-insulated (6 in.) throughout. A subgrade has been constructed underneath this floor insulation. This has a positive ventilating system. Thus frost accumulation is prevented, and the floor is safeguarded against buckling.

Used in the subgrade is 6-in. clay tiling on 6-ft. centers for a ventilating grid. Each of three ¼-hp., 6-in-dia. squirrel cage fans deliver 900 cfm. of air, at ¼-in. static pressure, through the subgrade.

FIFO Routine

Following a "first in, first out" routine, frozen products are withdrawn, as needed, from this frozen storage. They are then transferred to the adjacent defrost room, where proper low-dewpoint temperature is maintained to prevent condensation.

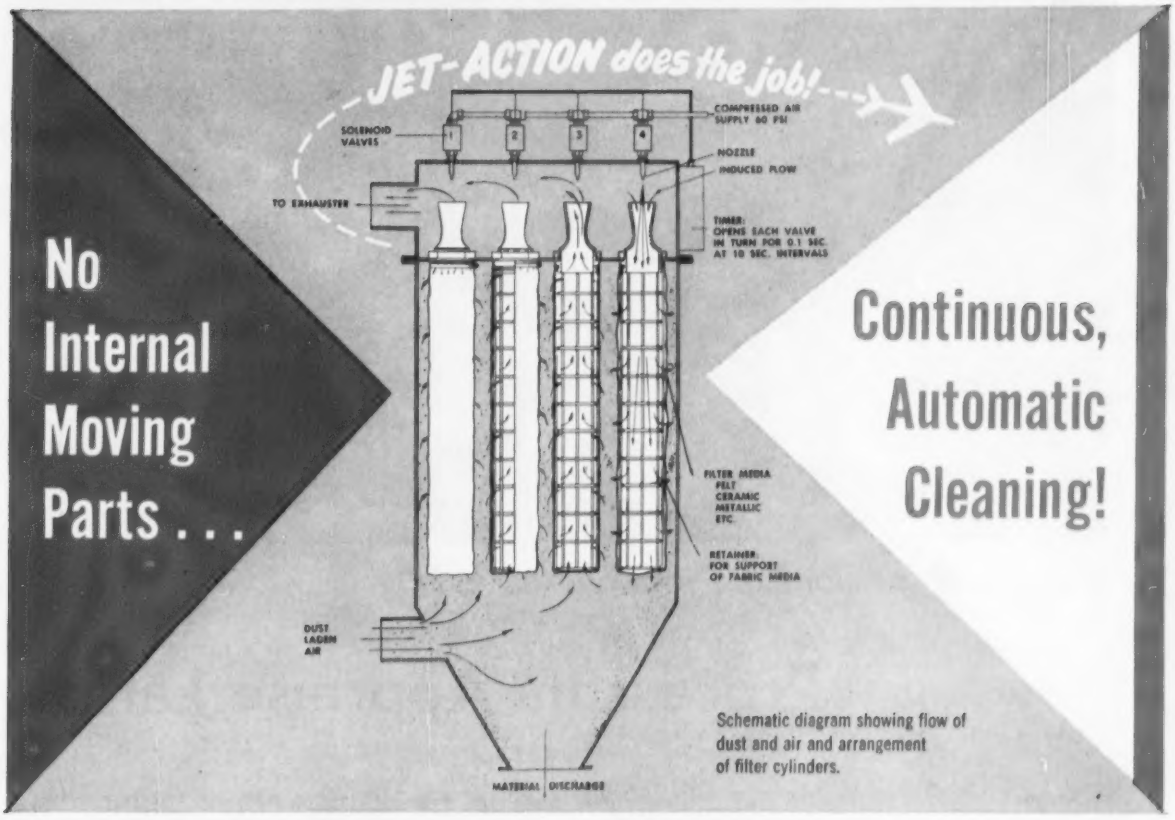
This latter is most important, since condensation conditions can damage wrappers and cartons during the 2-to-4 hr. defrosting period.

The room operates under controlled temperature (90F.) and humidity (below 30%), with additional air circulated at a 4,000-cfm. rate by ten 17-in-dia. fans.

Circulating around products to pick up moisture, the air is carried by ducts to a dehumidifier with 5-hp. motor. Here, moisture from the air condenses on refrigerated coils and then drains off.

Cool, dry air then passes through a 2-duct heater (250,000 Btu.'s), where it is re-heated to 85-90F., ready for recirculation at a 2,000-cfm. rate into the defrost room.

Upon withdrawal from the defrost room, the baked goods are immediately sorted and delivered. —*End*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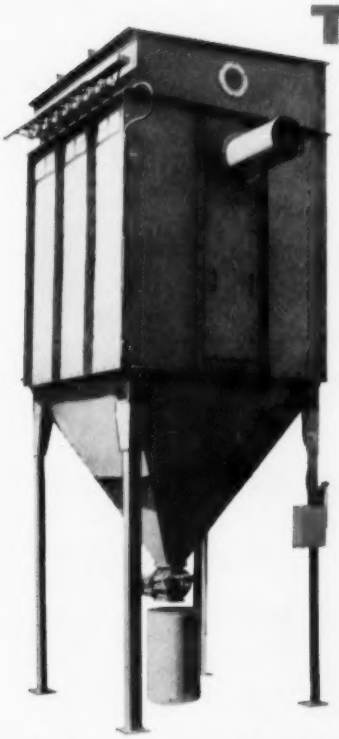
RETAINER FOR SUPPORT OF FABRIC MEDIA
DUST LADEN AIR
MATERIAL DISCHARGE

Schematic diagram showing flow of dust and air and arrangement of filter cylinders.

The MIKRO-PULSAIRE* COLLECTOR



Model 48-6 MIKRO-PULSAIRE Collector—340 sq. ft. of filter area—capacities 2000-5000 cfm. A complete line of units for all collection jobs.

There are *no internal moving parts* in this radically new *jet-action* MIKRO-PULSAIRE Collector! Cleaning mechanisms with their gears, cams, chains and hoses have been entirely eliminated . . . maintenance costs are drastically reduced . . . process interruptions are avoided! This completely simplified unit is the first collector to offer *continuous automatic cleaning* with no moving parts — *true economy in operation*, at highest filtering efficiency . . . 99.9% *plus!* You'll find full details, performance data, etc., in MIKRO-PULSAIRE Bulletin 52A. It's yours for the asking.

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Processors Appraise Latest

FE STAFF

HIGHLIGHTS of the recent 11th Annual Conference of the Pennsylvania Manufacturing Confectioners' Assn., Lancaster, Pa., were practical pointers on:

1. Advanced air conditioning for candy manufacturing and storing.
2. Automatic and continuous measurement and recording of viscosity at any point in processing.
3. Production of quality panned goods.
4. A suggested application of freezing methods in introducing a new line of confections.
5. Ideal techniques to extend shelf-life.
6. A recommended use of chocolate as a flavor.
7. A newer role of dairy solids.
8. Latest approach in the use of liquid sugar.

1. AIR CONDITIONING

New developments for economically producing any desired air conditioning results were reported by F. M. Johnson, Surface Combustion Corp., Toledo. He cited the following specific examples:

A. Hard candy room to be maintained at 75F. and 30% RH (see Fig. 1). Cooling tower water (85F.) is used to condition the 5,000 cfm.

4 Examples of Advanced

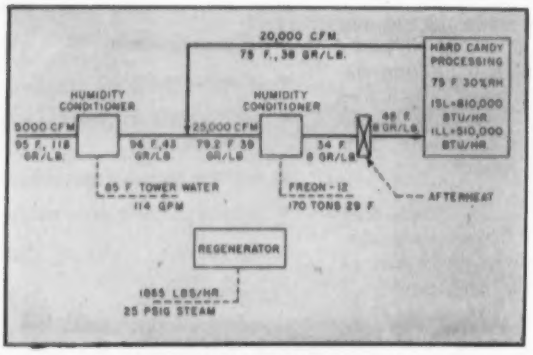

Fig. 1. **HUMIDITY CONDITIONERS** employ cooling-tower water and Freon to maintain 75F. and 30% RH in hard candy processing department, with open slots carrying candies in and out of room.

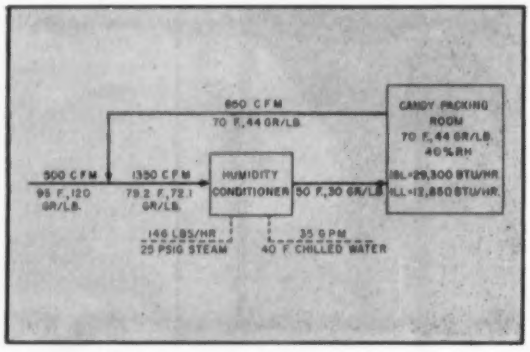

Fig. 2. **CANDY-PACKAGING ROOM,** employs small chemical unit to maintain 70F. and 40% RH, does not require control instruments. Unit is set at constant temperature so it will provide lower RH with load variation.

Advances in air conditioning, viscosity control, and panning gaged by experts at Pennsylvania Confectioners meeting. Frozen confections, storage, chocolate flavor, dairy solids, liquid sugar also scrutinized

Techniques

of makeup air. This air is mixed with 20,000 cfm. of return air from the room to provide 25,000 cfm. at 79.2F. and 39 grains per pound of moisture. Mixture is then reduced to 9 gr. or 10F. dew point and 45F. dry bulb and fed to room to maintain the desired temperature and humidity.

B. Drying room for cake mix to be held at 78F. and 45% RH. Here 5,000 cfm. of makeup air at 95F., and 118 gr. is passed through a chemical humidity conditioner. It is then cooled to 59F. with refrigeration and mixed with 7,000 cfm. of recirculated air to produce 70F., 55.3 gr./lb. air which is supplied to the dryer.

C. Hard candy packing room to be maintained at 70F. and 40% RH. Simplest way is to use a small chemical conditioner. In this case, 500 cfm. of outside air at 95F. and 120 gr. is mixed with 850 cfm. of return air at 70F. and 44 gr. to provide air at 79.2F. and 72.1 gr. This mixture is conditioned to 50F. and 30 gr. to pick up internal sensible and latent load (Fig. 2).

D. Storage room to be held at 50F. and 35% RH, and other areas at 50F. and 50% RH. (Fig. 3). All areas are furnished with air at 41F. and 14 gr. However, the 50F., 35% RH room receives 10,000 cfm. while the 50F., 50 RH area is fed only 2,500 cfm. Desired conditions are obtained by treating 4,000 cfm. of makeup air in a conditioning unit using 75F. lake water, then mixing it with 8,500 cfm. of return air. This is passed through a second humidity conditioner, cooled with 28F. brine, which delivers 41F. and 14 gr. air.

E. Cooling tunnels for nougat centers, to be supplied with frost-free air at 0F. and 2 gr. (Fig. 4). This large installation involves treating more than ¼ million cfm. of air for eight tunnels. Big problem was to cool the alloy belts on which the candy is spread.

Solution in the humidity conditioners is brine-cooled to −10F. Regeneration of solution is by a package unit comprising regenerator and economizer coils to reduce refrigeration requirements.

2. VISCOSITY CONTROL

A recent development for measuring and recording viscosity at any point in the process directly, automatically, and continuously was reported by W. S. Young, The Foxboro Co., Foxboro, Mass.

Readings may be directly related to finished product characteristics, or indirectly to total solids and moisture content.

Employed is a Brookfield Viscometran transmitter. It produces a signal that is measured by a Foxboro Dynalog recorder. With this combination, theoretical and laboratory results are exactly duplicated. The Viscometran, with capacitance transmission (Model VT-CKQ), is available in any range from 0-10 cp. minimum to 0-50,000 cp. maximum. It has an accuracy of better than ±1% and repeatability measurement of better than 0.2%.

For kettle installation the spindle can be shielded by a 3-in. o.d. baffle tube, which mounts directly to the units base. Distance of spindle from transmitter may vary from 6 in. to 9 ft.

Fig. 5 shows an installation designed for a chocolate line. Chocolate and cocoa butter are mixed prior to being pumped through a line to a filling operation where the product is cast into blocks. Viscometran and recorder were placed on the line to show whether or not the cocoa but-

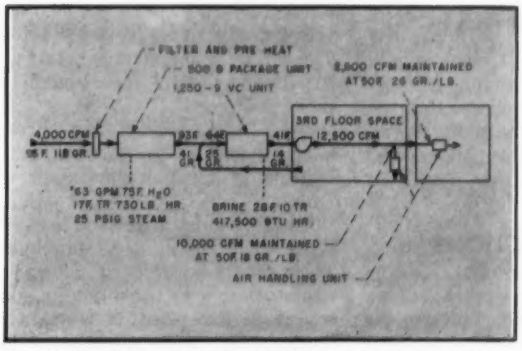

Fig. 3. **LARGE CANDY STORAGE** areas are maintained under different conditions by main unit with separate air-handling facilities. Employed is combination of chemical humidity conditioning with refrigeration.

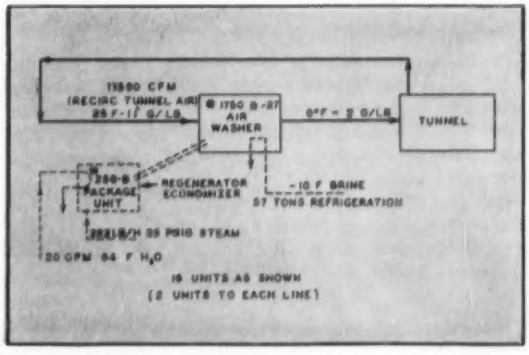

Fig. 4. **INSTALLATION** is designed to supply 0F. air without frost, for nougat centers traveling through eight cooling tunnels. It's been operating 9 yr. without defrosting of coils.

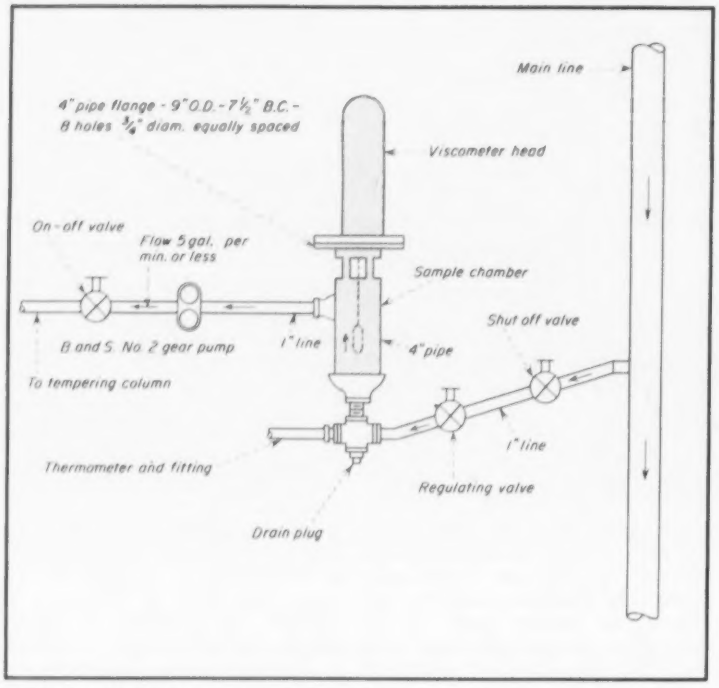

FIG. 5. **IN-LINE** installation of Viscometran for chocolate line measures viscosity and thus shows if cocoa butter has been thoroughly mixed.

ter and chocolate have been thoroughly mixed.

Chocolate is gravity-fed from main line into the bottom of sample chamber. Sample flow rate is regulated by manually positioning the hand valve in the line. Overflow ports are provided at top of chamber to eliminate any possibility of chocolate getting into the Viscometran housing. A temperature-sensing bulb is installed at the bottom of the sample chamber.

3. CHOCOLATE PANNING

Minimum equipment required for chocolate panning, according to C. Carilli, Edgar P. Lewis & Sons, Inc., Malden, Mass., is eight engrossing pans and eight polishing pans with ribs, a good spraying system, kettles, an air compressor, and a tank with a circulator for hot water for the jacketed pipes going to the sprayer. Room temperature should be maintained between 45 to 50F., but air blowing into the pans should be 35F. with a velocity of 2,000 fpm. and a 30% RH.

Centers should be prepared by dampening with simple syrup and drying with fruit-fine sugar (or a combination of 2 parts 6X powdered sugar and 1 part cocoa powder).

Temperature of the dark chocolate should be maintained at 99-100F., and that of the milk chocolate 95-96F. so they will flow freely to the sprayers.

After the required amount of chocolate is sprayed on the centers, they are polished with small wettings of the following solution: 36 lb. of powdered gum Arabic dissolved in 3 gal. boiling water, with 2 lb. of corn syrup then added.

For each 200 lb. of goods, 6-3 oz. wettings should be sufficient to attain a brilliant dry luster, after which 3 oz. of candy lacquer is applied. As soon as dry, candies are ready to be packaged.

For panning, Mr. Carilli visualized a long air-controlled rotating cylinder drum equipped with chocolate sprayers. The centers enter from one end and emerge ready to pack at the other.

4. NEW CONFECTIONS

In the opinion of Herb Knechtel, Knechtel Laboratories, Chicago, the most pertinent application of freezing is not for storage, but in developing, making, and merchandising a new line of specially formulated candy.

Fact that the candy is frozen permits use of dairy products without fear of oxidative rancidity.

For example, take a butter caramel cooked to somewhere around 235F., and eat it at a temperature near that of the home refrigerator (40F.). It can be handled but virtually disintegrates in the mouth. This candy doesn't need much in the way of milk solids. Freezing or cold temperature will hold it in shape.

An assortment of candies can be made with a standard depositor, and the variations necessary to enhance appearance can be easily carried out. Candies will be brighter and more appealing to the eye. Nut meats and other decorations may be sprinkled on top, since these, in turn, are protected by freezing.

There is a wide range of cellulose and foil receptacles into which this candy may be cast. For inspiration, one need only examine some of the European assortments, with their filled cornucopias and other novelties.

5. STORING CANDIES

With minor exceptions, proper storage temperature for candy is −20F. or lower. But, this temperature is not presently feasible, primarily from the standpoint of economics.

What, then, can be done to prolong the shelf-life of candy? Humectants such as invert sugar, sorbitol, or glycerin may be added to prevent loss of moisture and change in crystal structure. Invertase may be used to invert the sugar and change the liquid phase of fondant creams. Antioxidants may be incorporated to retard development of rancidity. And much can be accomplished by moisture and vapor-proof packaging.

Solid chocolate and chocolate-coated candies must be stored below the melting point of the cocoa butter. Economically, this would be about 65F. with 65% RH or less. However, other factors must be considered, such as presence of nuts, addition of invertase, and type of centers.

Certain candies have shelf-lives dependent primarily on humidity. These should be stored at a constant temperature, with the humidity controlled to the point at which the candy neither gains nor loses moisture.

Fats, such as added butterfat or that contained in whole milk, and other unsaturated animal and vege-

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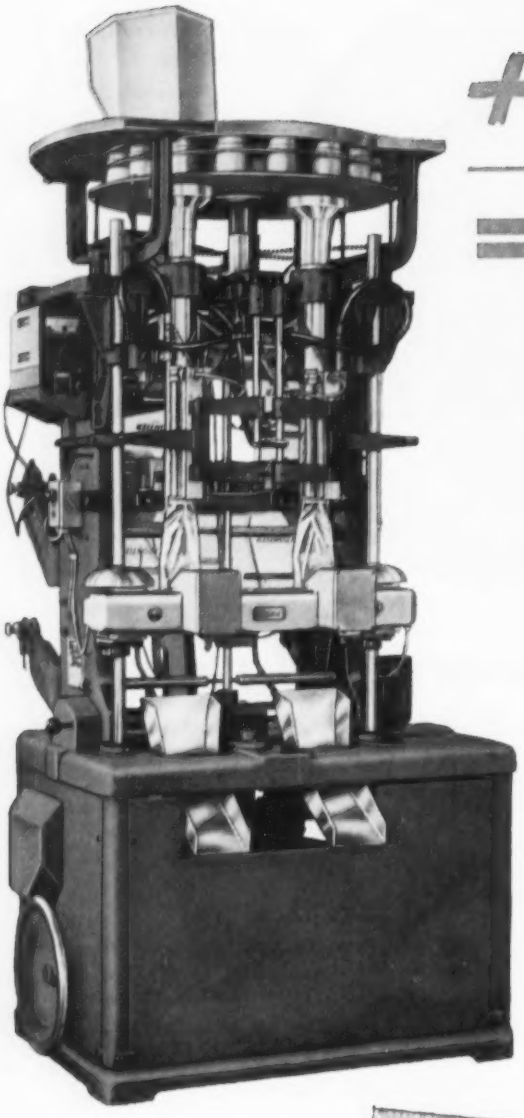

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table fats, are very susceptible to oxidative rancidity. Essential oils used for flavoring are in the same category. High lauric types of fats, such as coconut oil are subject to hydrolytic rancidity. The lower the storage temperature, the slower the development of rancidity.

Proteins, too, are subject to oxidation, and the resultant deterioration in color and flavor. This can also be retarded by refrigerated storage.

Nuts have always had a very short shelf-life. Most important cause of deterioration is oxidative rancidity. Roasting, in the case of almonds and peanuts, accelerates this defect. When longer shelf-life is required, refrigerated storage is a must.

Another type of deterioration of nuts is moisture absorption with loss of crispness and development of a stale taste. When components of candy contain moisture, this defect is not easily overcome. But, when the nuts are in solid chocolate, moisture absorption can be controlled by adjusting relative humidity of the air in the storage area.

Change in color is caused by protein deterioration, which results in browning. Also, when colored candies such as creams lose moisture, with a resultant change in crystal structure, a change in the color occurs. Cold storage under the correct humidity will retard or completely prevent these changes.

Imitation flavors are fairly stable under most storage conditions. But high temperatures may have detrimental effects. Essential oils are subject to oxidative rancidity and will develop off-flavors.

6. CHOCOLATE FLAVOR

In the belief of N. W. Kempf, Walter Baker Div., General Foods Corp., Dorchester, Mass., chocolate flavoring of candies is open to further possibilities—not having been exploited as fully as chocolate coating of confections.

Best results are obtained with a good chocolate liquor, made from selected flavor beans. If it is melted when added, it mixes easily into the batch. In the case of hard candies, it is best to incorporate it with the batch on the slab.

In many cases, we must obtain our flavor from cocoa powders. They are available with various fat contents from 24% down to below 1%, and in a great range of colors and flavors. When chocolate or cocoa powder is used, the quantity needed to obtain a good flavor balance depends upon the relative sweetness of the product.

One example is chocolate fudge. There's an instant burst of chocolate flavor in the liquor-flavored samples, as compared with the flatter flavor of the cocoa-powder one. Color of the powder-flavored fudge is darker, because of the darker color characteristics of the base beans.

Formulas call for 11 lb. of liquor or 6 lb. of cocoa powder, plus 5 lb. of vegetable fat per 100 lb. of fudge.

Because of unfavorable action of fat on the surface tension of solutions of most whipping agents, flavoring of nougat is best accomplished by adding cocoa powder to the batch after whipping it to the desired consistency.

There are a number of other flavors which can be used to complement chocolate when it is used as a flavor. Most important is vanilla. Coffee and peppermint also make pleasing combinations with chocolate in candies.

7. NEW DAIRY SOLIDS

Six good reasons for using powdered milk products in candies were cited by J. V. Reger, Western Condensing Co., Appleton, Wis.:

A. They are exceptionally uniform in quality.

B. They occupy much less space per 100 lb. than any condensed or fluid milk product.

C. They are easy to handle, even in cold weather, since there is no "flow" problem.

D. Losses due to bacterial or mold spoilage are eliminated.

E. They are available in many forms.

F. Their use results in substantial savings in ingredient costs.

Relative to the last point, for example, sweetened condensed whole milk is available at about $14.50/100 lb. It contains approximately 8.5% butterfat, 20% milk solids nonfat, 42½% sugar and 29% water. This same product, made by reconstituting nonfat milk solids and adding sugar and butterfat, would cost approximately $12.97/100 lb., and when 50% of the nonfat dry milk solids is in the form of sweet dry whey, the cost would be only about $12.32.

Sweet dry whey contains approximately 72% lactose, which is roughly 50% more than in nonfat dry milk. Because lactose plays such an important role in development of full caramel flavor, you can expect this material to impart a better flavor than other dairy products. Lactose also is a flavor carrier.

Protein in sweet dry whey is largely of the albumin type, which imparts smooth body and texture to candies. However, it does not have the structure-building characteristics of casein protein. Accordingly, for firm caramels, not more than 40% of the milk-solids-not-fat should be dried whey.

For softer caramel, it can represent 50 to 65% of the milk-solids-not-fat and for caramel or butterscotch toppings, it can constitute all of the milk solids.

8. LATEST ON LIQUID SUGAR

Today, with the aid of ion exchange, great volumes of liquid sugars are being produced that have a quality superior in refinement to ordinary granulated sugar, pointed out D. V. Wadsworth, Refined Syrups & Sugars, Inc., Yonkers, N. Y.

And, before long, he said, equipment will be available for reducing its water content to any percentage desired. It will be done while the product is in transit from tank storage to process.

If factory batches require elimination of all moisture, this, too, can be done.

At this time the solid content must comprise a minimum of 90% sucrose, or not more than 10% of other sugars. Latter might be all invert, all dextrose, all lactose, all corn syrup, or a combination of these sugars.

Resulting dry sugar is radically different from the regular granulated product. Here are some of its unusual qualities.

A. It is brittle.

B. Unlike hard grain sugar, surfaces are not smooth, but have jagged edges. Clusters are somewhat porous, and go into solution rapidly.

C. Particle sizes range from extra-fine to 6X powdered. Major portion of the clusters are estimated to be about the size of baker's special sugar crystals.

D. They can be disintegrated to powder fineness with much less power than is required to reduce hard grain sugars to the same degree.

E. They may be incorporated directly in cocoa liquor or icings without grinding, or mixed with other dry crystalline materials with less stratification than when the granulated product is used.

Roundup on *ULTRASONICS*

Mid-'57 finds the high-frequency waves getting a try along a broad food-field front . . . Timely check reveals actual line operations, functions shaping up in laboratories, many new promising ideas

HAROLD RAPP
Assistant Editor, "Food Engineering"

DO YOU FIGURE there's a market for eggs scrambled within the shell?

The fact is that ultrasonics can produce this odd dish. And this is just one striking example of the interesting food-field possibilities that may be ventured through the medium of inaudible vibrations.

The list of ideas is almost endless. And lab tests have already proved many of them possible.

True, only a few have yet been cheap enough to warrant commercial adaptation. Nevertheless, the number is growing. And reports are coming in from users hailing the numerous advantages. For instance, ultrasonics—

1. Makes extra-smooth emulsions in peanut butter and ice cream. Also, cuts down on the amount of surface-active agent required to form emulsions. Result: Better product flavor and augmented quality at less expense.

2. Gives fine dispersion of particles in gravies and sauces.

3. Aids low-temperature extraction of flavors from such products as beer hops, vanilla beans, and red peppers.

4. In a contrasting sanitizing function, cleans tough scale and hard-to-get-at parts quickly and efficiently in breweries, dairies, and meat-packing plants.

Actual Plant Applications

Over a dozen different foods have been processed in England by one line of ultrasonic equipment. And these same units have recently been

introduced into the U. S. The machines (Sonic Engineering Corp., Stamford, Conn.) are used for homogenizing, emulsifying, and dispersing. Specifically, they develop ultrasonic energy by the whistle principle (see accompanying explanatory panel).

As for improving the texture of peanut butter in ultrasonic units, it's noted that the Kroger company is already trying out a pair of the machines on this process.

The foods thus treated in Britain and the U. S. include ice cream, margarine, soups, puddings, apple pulp, salad dressings, egg emulsions, chicken gravy, spiced sauce, tomato cocktail, essential oils for soft drinks, bakery sponge mixtures, and bread preservatives.

A degassing unit (Mack Electronics Div., Plainfield, N. J.) is on the bottle filling line at P. Ballantine & Sons, brewery (FE Mar. '57, p. 119). Here, new low levels of gas concentration in beer have been achieved, resulting in better protection of quality factors.

The chocolate conching process (removing undesirable volatiles) has been mastered by ultrasonic equipment in several European countries (FE May '55, p. 82).

A patented English process linking ultrasonic treatment with freezing allows milk to be stored a year or more without deterioration. At least one dairy is producing the frozen product for use on long sea voyages and as a means of storing milk.

In this process, the milk is first pasteurized, then treated for 5 min. with vibrations at 1 to 1.3 megacycles per sec. and a power of 150w. per gal. There follows filling into polyethylene bags, or other suitable containers.

Freezing takes place in a brine bath not over 5F. (e.g. between 4 and 5F.). Size of containers should be such that complete freezing is achieved within 40 min. Otherwise, there may be some fat separation. Storage should be at 5 to 10F.

Also in Europe, commercial beer wort extractors are increasing flavor derived from hops by 40% (FE Nov. '55, p. 174).

Two manufacturers (Bendix Aviation Corp., Davenport, Iowa, and Branson Ultrasonic Corp., Stamford, Conn.) report that their cleaning units are installed in several dairies and breweries. In some cases, their use in cleaning processing and filling equipment has become routine.

And Bendix has also developed a unit for cleaning scale from meat hooks. At last word this was pending adoption by a Midwest packer.

Another Bendix device that continuously indicates, controls, and records liquid viscosity is reportedly installed in a gelatin process.

Showing Big Potential

Three flow-rate indicators have been devised. Main advantages of these units are that they place no obstructions in the path of flowing liquids and can be made with simple, sanitary construction.

One of these (Fischer & Porter Co., Hatboro, Pa.) has a smooth stainless interior and a capacity that's reportedly unlimited. It can be used at temperatures up to 600F., and accuracy is within ½% at high throughputs (FE Nov. '55, p. 175).

The second is a precision instrument provided with a 5v. full-scale output to feed into standard telemetering and recording systems (Gulton Industries, Inc., Metuchen, N. J.).

The third was developed at the National Bureau of Standards Laboratory—a project now handled by Diamond Ordnance Fuze Laboratories, Washington, D. C.

Where corrosion has eaten away the walls of pipe and equipment, ultrasonic gages can determine the residual thickness without having to

Box Score of Applications

OPERATION	PRODUCT	STAGE OF DEVELOPMENT
Homogenizing	Peanut butter, ice cream, soups, puddings, salad dressings, sauces.	In commercial use
Freezing	Milk	
Extracting	Beer wort	
Conching	Chocolate	
Degassing	Beer	
Controlling viscosity	Gelatin	
Cleaning	Dairy and brewery equipment, and scale from meat hooks	
Measuring flow rate	Liquids	Commercially available
Cleaning	Fecal matter from eggs	
Determining tank level	Liquids	
Gaging wall thickness	Process equipment	
Manufacturing	Cream cheese mixes	Patents Issued
Dispersing water	Butter	
Controlling moisture	Cheese	
Extracting	Coffee oil from beans	Lab-tested possibilities
	Red pepper oil	
	Vanilla oil	
Decorticating	Sesame seed	
Aging	Cheese	
Preventing crystallization	Honey	
Degassing	Milk, juice, soup	
Slurry making	Potato starch	
Destroying enzymes	Sugar	
Separating	Solids from fumes	
Removing	Meat from bones	Possibilities
Separating	Starch from slurries	
Aging	Wine	
Fermenting	Yeast products	
Clarifying	Fruit and vegetable juices	
Washing	Bottles	
Improving properties	Gelatin and pectin	
Destroying	Grain weevils	
Crystallizing	Sugar	
Homogenizing	Milk	Tests unsatisfactory
Emulsifying	French dressing	
Sterilizing	Milk, liquids	

Gist of Ultrasonics

When you hear vibration waves, they're sonic. But when they are pitched above the audible range—over 18,000 cycles per second—they're ultrasonic.

Researchers found that these latter waves pack a force that can be extremely useful in carrying out a variety of work.

Among the commercial machines developed to generate them, three types (see photos, above) predominate in the food field. The ultrasonic whistle impinges a high-pressure liquid jet on the edge of a blade that vibrates at its natural frequency.

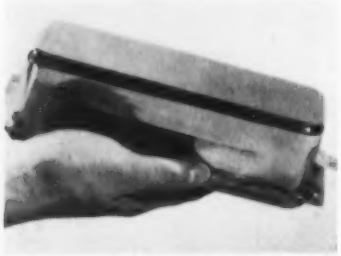
The crystal transducers employ piezoelectric materials that vibrate when impressed with an alternating electric charge.

And the magnetostrictors develop wave energy by passing an alternating current through a coil that surrounds a special nickel-containing material whose dimensions actually change under the influence of a magnetic field.

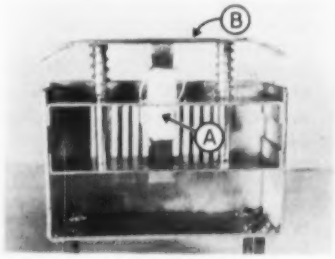
In each case, the work done by ultrasonics results from what is called cavitation or "cold boiling"—the formation and collapse of millions of tiny vapor bubbles many thousand times per second.

3 Types of High-Pulse Generators

ULTRASONIC WHISTLE units are seen here in lab setup for testing new food formulations (Sonic Engineering Corp.). Now under wave treatments are novel bakery mixes. Plant size unit (left) ultrasonically blends in minor ingredients while main product is recirculated. Smaller model is for making trial emulsions.



CRYSTAL TRANSDUCER (barium titanate encased in stainless steel) is a type being applied in both food processing and cleaning operations. Banks of them can be arranged to treat large areas.



MAGNETOSTRICTOR transducer throbs at frequency of current delivered from special power unit. Coil-wrapped core (A) converts electrical impulses to mechanical energy that vibrates spring-mounted shoe (B).

drill a hole through the wall. Especially useful in the case of jacketed kettles or long pipe sections, these units may be either bought or leased.

Other commercially available ultrasonic devices include one for determining the level of liquid in a tank.

Seeking New Uses

Extractions appear susceptible to improvement by the use of ultrasonics. Several companies are experimenting in the attempt to gain more efficient removal of vanilla flavor from beans by an ultrasonic process. And Bendix reports successful lab extractions of flavor oil from coffee beans.

Processors using chili pepper conventionally examine their batches to determine the amount of color and pungency that this ingredient will add to their products. At present, this is a lengthy procedure involving the use of solvent extraction and continuous distillation. However, one processor—Wolf Brand, of Corsicana, Tex.—is attempting quicker extraction of color and flavor from spices by means of an ultrasonic generator (Alcar Instruments, Inc., Little Ferry, N. J.). As yet, however, no standardized method capable of consistent results has been established.

Another lab conquest via ultrasonics is the decortication of sesame seed.

Use of the waves to speed the ripening of cheese has already been demonstrated by Prof. W. C. Winder and associates at the University of Wisconsin. Flavor of the treated cheddar is hailed as equal to that of product aged for a much longer period. Thus, it is possible to make sharp cheese in a matter of weeks.

Degassing of milk has also been done at the above lab. And other researchers have applied the principle to carbonated beverages.

The speedy vibrations have prevented a crystallization of honey in storage. This is remarkable, since in some cases ultrasonics *promotes* crystallization. It all depends on the frequency and energy level of the waves used. In this case, flavor and appearance were also improved and yeast growth held in check. A Louisiana State U. researcher, Prof. S. A. Kaloyereas, states that a commercial adaptation of this process can readily be worked out.

Cleaning fecal matter from eggs has strong possibilities. In fact, one

(Turn page)

manufacturer (Murdoch Laboratories, Port Washington, N. Y.) is now ready to give it a try.

Still other investigations have explored: (1) Emulsifying of French dressing (tests, however, were unsuccessful because the tomato pulp absorbed too much energy), (2) improving properties of gelatin and pectin, (3) crystallizing sugar, (4) suspension of potato starch (some of these slurries have been prepared).

Additional studies include: (5) Sterilization, especially of milk (but this has not been promising, mainly because the growth of some bacteria is promoted by the breaking of clumps) and (6) destruction of sugar enzymes and conversion to invert. To be noted, further, are: (7) Killing of weevils during grain storage, and (8) removal of solids from stack fumes and sprayer-dryer exhausts.

Moreover, German patents have been issued for manufacture of cream cheese mixes, achieving finer dispersion of water in butter (said to decrease microbial growth). Also for removal of whey from cheese (with moisture content regulated by adjusting the frequency and intensity of vibrations).

Today's Promising Ideas

Proposed applications—those as yet untried, or those that have been given only a minimum of lab work—are: (1) Separating of starch from slurries, (2) removing meat from bones, (3) clarifying of fruit and vegetable juices, (4) fermenting of yeast products, (5) aging of wine, and (6) bottle washing.

Finally, let's frame an overall view: Certainly, the "feeling out" applications of ultrasonics in food processing are now on the rise.

Commercially speaking, however, it must be admitted that these techniques are only just off the starting line.

But perhaps in time—and especially with increased dissemination of knowledge and lower costs—the high frequency waves will find their recognized place in food field methodology. Meanwhile, a more open approach, less hobbled by secrecy concerning applications, will help smooth the way.

As for the concept of people in the field of ultrasonics, some feel that the wave units have suffered from initial "over-selling" by promotion-minded individuals. But from here on out, the more realistic influences should prevail. —*End*

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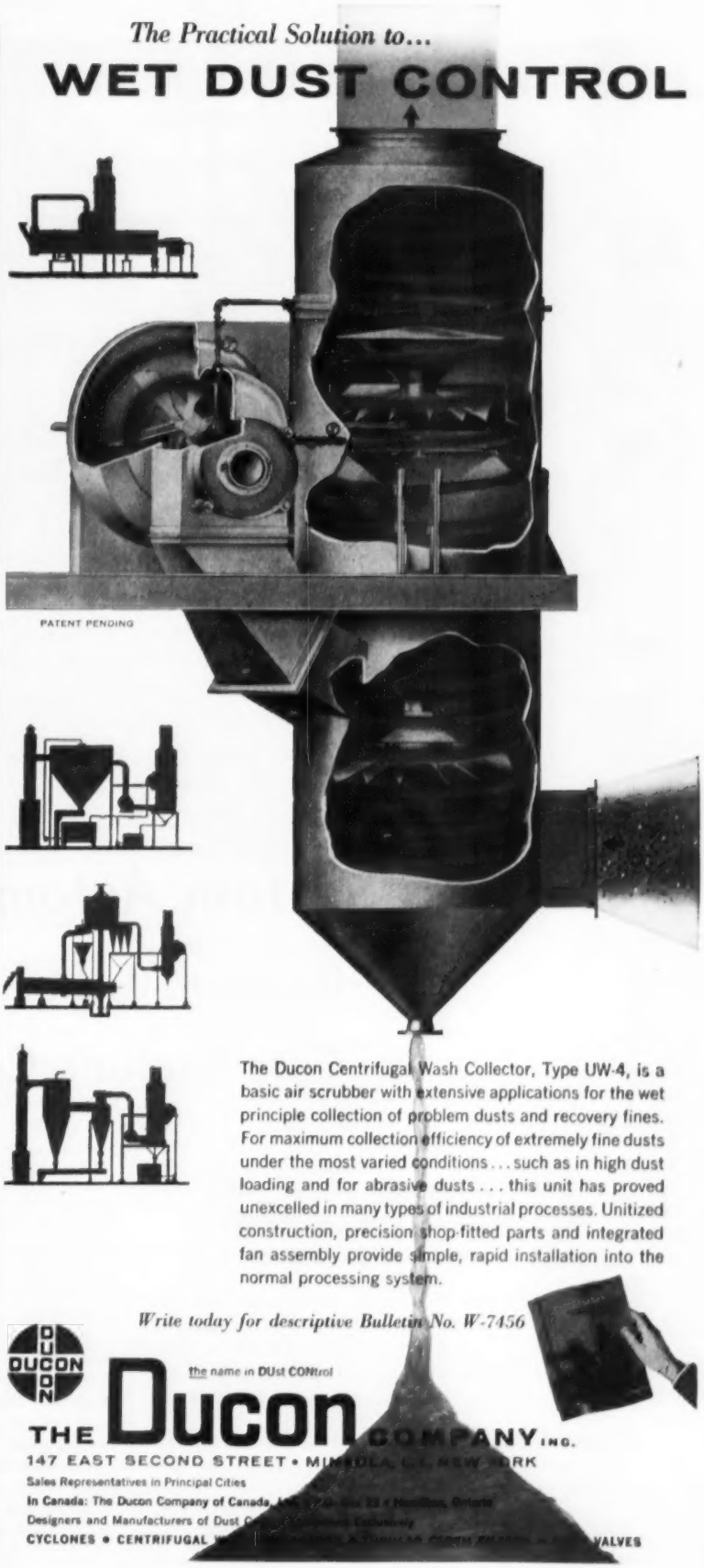

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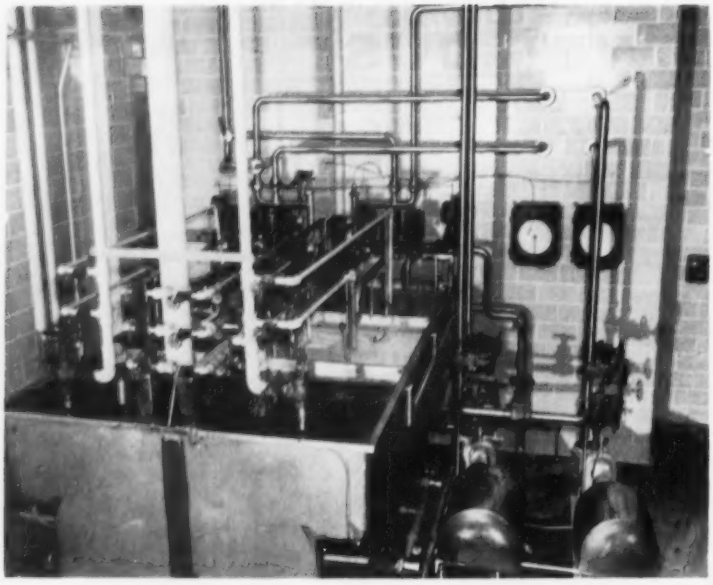

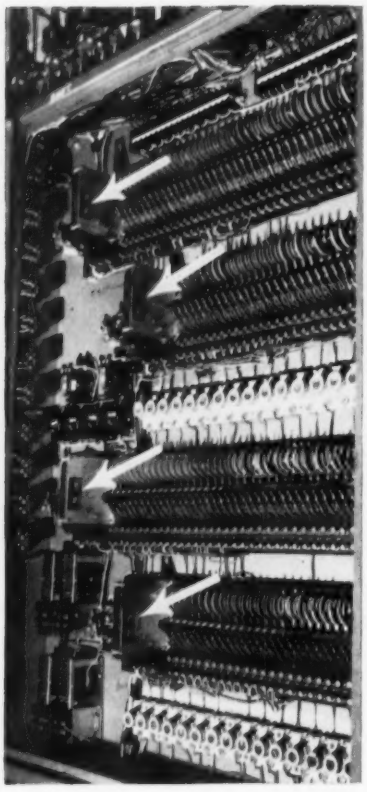

HEART OF SYSTEM is 6-compartment, steam-coil-heated supply tank (above) and automatic controls (right). Tank is separated into two 3-bank compartments. Each bank has two pumps that supply solutions to selected pipe systems or tanks. Pushbuttons on wall at right of temperature recorders actuate solution supply and timing systems. Four electric clocks (arrows) in panel (right) automatically time the cam-operated sanitizing sequences.

Cleaning System *Automated*

★ Reduces Labor

★ Cuts Bacteria Counts

Pushbutton-controlled dairy setup minimizes human errors in sanitizing pipelines, storage tanks, road tankers

C. R. HAVIGHORST
Senior Associate Editor, "Food Engineering"

TO PIONEER revolutionary advances is one thing. To make them really "stick" with demonstrated facts takes a lot more.

In point are the strides made by Lucerne Milk Co., Oakland, Calif.—where radical progress is a habit.

In 1951, this company put into action the first clean-in-place pipe system to be installed in any milk plant (FE Sept. '51, p. 74). Then, with it, Lucerne offered something most impressive to sanitarians—full bacteriological data to prove that the new sanitizing system was far superior to the conventional take-down-to-clean equipment.

Now, at its Los Angeles plant, the company has made more striking strides. Among these are CIP refinements and innovations, including "pushbutton" control and extending the automatic cleaning to storage tanks and road tankers.

And again Lucerne has presented data showing how counts have been reduced well below those of the plant from which it moved (see accompanying table).

Significant, too, is the fact that this improvement has been achieved despite the employment of welded CIP

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SAFER-EASY ON, EASY OFF..... STEP HEIGHT	7"	13"	13¾"	13⅞"
MORE PRODUCTIVE..... LIFT SPEED F.P.M.	65	55	45	45
MORE VERSATILE..... GRADE CLEARANCE	45%	43.4%	45%	35%
MORE MANEUVERABLE... TURNING RADIUS	56"	59"	64"	57"
MAXIMUM HEAT PROTECTION. CLASS H, SILICONE INSULATED MOTORS—ALL MODELS	Yes	No	No	No

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Step-by Step Procedure in Automated Sanitation

Here's the full routine of the pipeline and tank cleaning operation at Lucerne:

1. At proper supply-pump, operator connects east (raw-milk) or west (pasteurizing) systems by valves. If cleaning a tank, he puts it on-stream by valve and pipe connections, then starts tank's agitator.
2. At control panel, operator switches over from "manual" to "automatic" and pushes button that actuates solution supply and timing systems.
3. As supply pump starts, he adjusts its pressure to 87 psi. to attain turbulent velocity at 5 ft. sec. through pipes and to tank's spray heads. Then automatic control take over.
4. Clear water rinses residual product from lines or tanks. Return-pump (which starts 32 sec. after supply pump) discharges water to sewer. Time: 3 min.
5. End rinse. Return pump continues to operate. Time: 2½ min.
6. Air-blast (filtered air at 24 psi.) and return pump clear lines. Then both are stopped. Time: ½ min.
7. Alkali valve opens and pump returns solution to alkali tank compartment. Time: 15 min.
8. Return pump continues to operate. Time: 1½ min.
9. Air-blast begins (same as No. 6). Time: ½ min.
10. Return pump stopped. Rinse-water cycle (same as No. 4) begins. Time: 1½ min.
11. Rinse water stopped, air-blast begins (same as No. 6). Time: ½ min.
12. Tanks are fog-sprayed (Paasche air-gun) with 1,000 ppm. chlorine solution.

lines, and the excellent record for sanitation chalked up by the old plant.

So efficient is the new cleaning system that standard plate counts of pasteurized milk for 76 operating days averaged 218.4 bacteria for storage tanks and 248.7 for cartons (Pure-Pak) of finished product.

Between the storage tanks and cartons, this milk had traveled 151 ft., through permanently welded stainless lines in which seven 3-way valves, a centrifugal pump, one tee and three ells are welded. In addition, it was exposed to the filler mechanisms of the packaging machines.

How Bacteria Counts Were Slashed

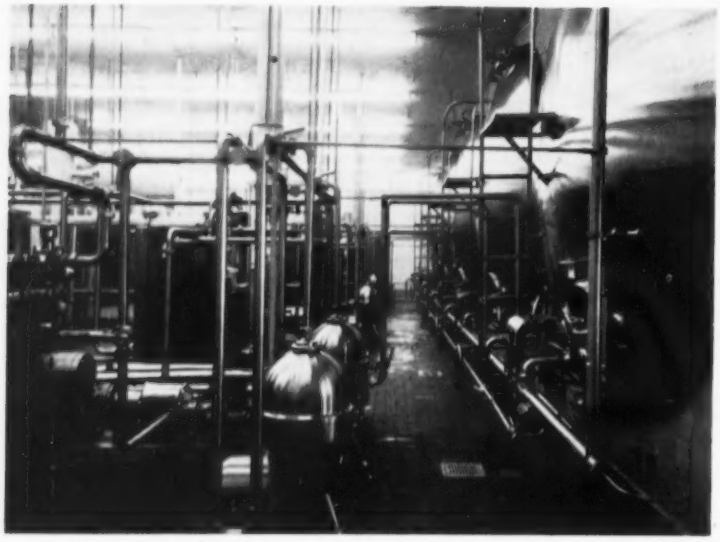
PRODUCT	Old Plant *	New Plant **
All purpose cream	235	208 (down 27)
Whipped cream	300	203 (down 97)
Half and Half	772	263 (down 509)
Chocolate drink	285	226 (down 59)
Skimmed milk	252	188 (down 64)
Homogenized milk	381	203 (down 178)

* Counts during last 16 weeks of operation.
** Counts during first 15 weeks of operation.

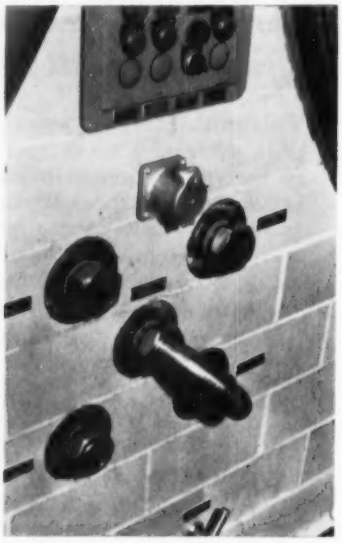
Robotized Sanitation

The new setup is a dual system by which either two pipelines or two storage tanks may be cleaned simultaneously. As is conventional CIP practice, product lines are connected with the recirculation lines. Then automatic controls take over and deliver clear-water, alkali solution, and compressed air in timed sequence (see accompanying panel).

Once each week, as a precautionary measure, buffered



EAST SIDE OF PLANT has five raw-milk storage tanks set in glazed tile wall, and 140 ft. of 2-in.-dia. welded stainless steel pipelines. Tanks and lines are both cleaned in place by new pushbutton-actuated system.



AT CLEANING STATION in tile wall gooseneck connects supply line (center) with feed to any of four tanks.

NINTH ADVERTISEMENT OF A SERIES *"THE HISTORY OF GLASS CONTAINERS"*

1812

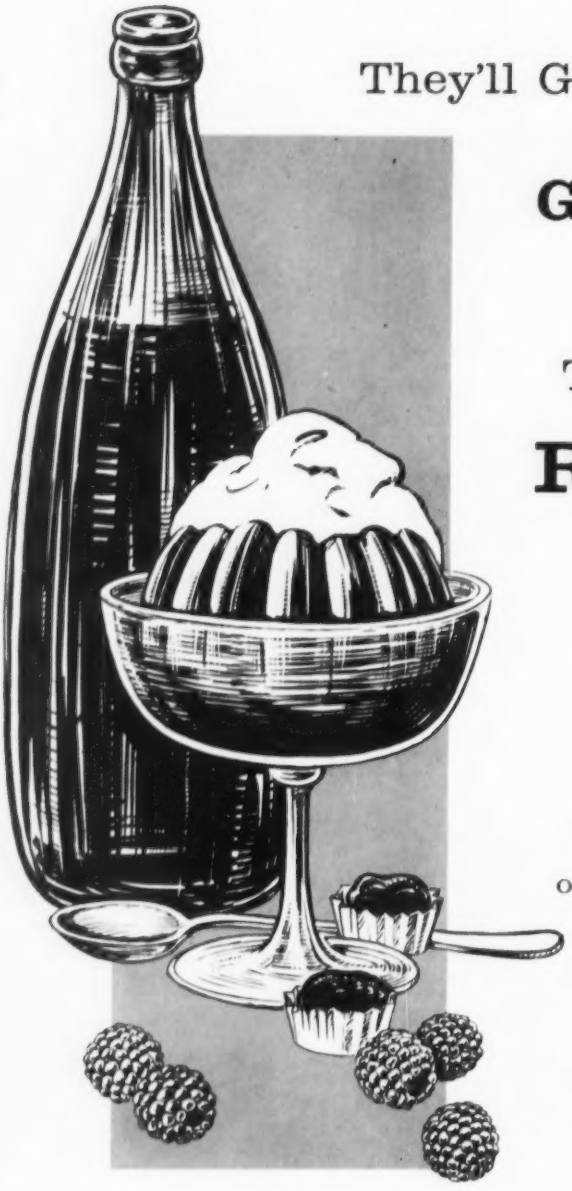
The British naval blockade of Chesapeake and Delaware Bays, during the War of 1812, seriously affected the glass bottle industry in the North by cutting off shipments of Virginia coal and other manufacturing essentials. Unable to meet the heavy cost of overland freight, manufacturers soon devised techniques that led to a more economical use of raw materials . . . and through experimentation, to a finer product.

Modern research at Metro has regularly provided the glass industry with improved and more efficient production methods . . . a part of METROmatic service . . . the service that assures packers a quality product, delivered on an unfailing schedule, geared to specific production requirements.

METRO GLASS COMPANY, INC.

MANUFACTURERS OF QUALITY GLASS CONTAINERS

WASHINGTON, PA JERSEY CITY, NEW JERSEY CHICAGO, ILL.



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Finer bouquet

More delicious flavor

Faithfully imparts true character

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phosphoric acid solution is substituted for the alkali in both pipe lines and tanks.

Control stations, located strategically near the tanks they serve, are easily put on-stream by connecting a pipe gooseneck to the inlet of the selected tank.

When chlorine solution is fog-sprayed into a tank, the operator merely places the air gun in the tank's man-hole for the required period.

In all, there are 590 ft. of 2 in. stainless, welded pipe lines, and 19 tanks (eight 10,000 gal., two 5,000 gal., two 3,500 gal., three 1,000 gal., and four 500 gal.).

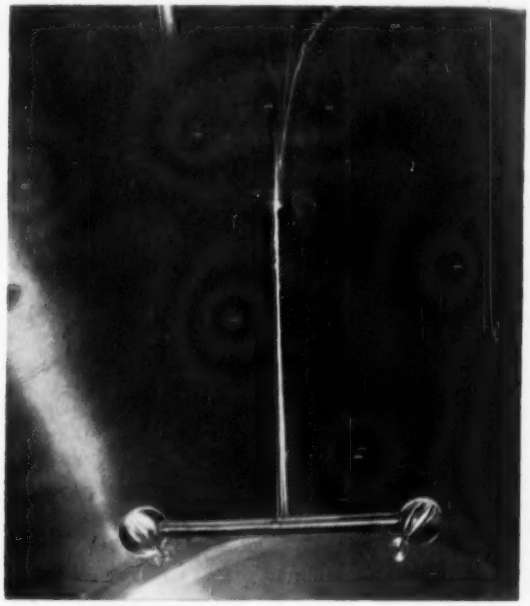
Of the pipe system, 140 ft. is in the east, or raw-milk side, and 450 ft. in the west, or pasteurized side. Spherical spray-heads in the tanks provide complete coverage. They clean by chemical rather than by force or jet action.

Cams, used for timing the cleaning sequence, are operated by electric clocks. As they rotate, each cam, in planned timing, energizes or shuts off its solenoid relay, which in turn controls the air-valves that open and shut the spring-valves. In addition, they control operation of both solution feed and return pumps.

Automatic, recording temperature controls regulate temperature of the tank compartments' heating coils.

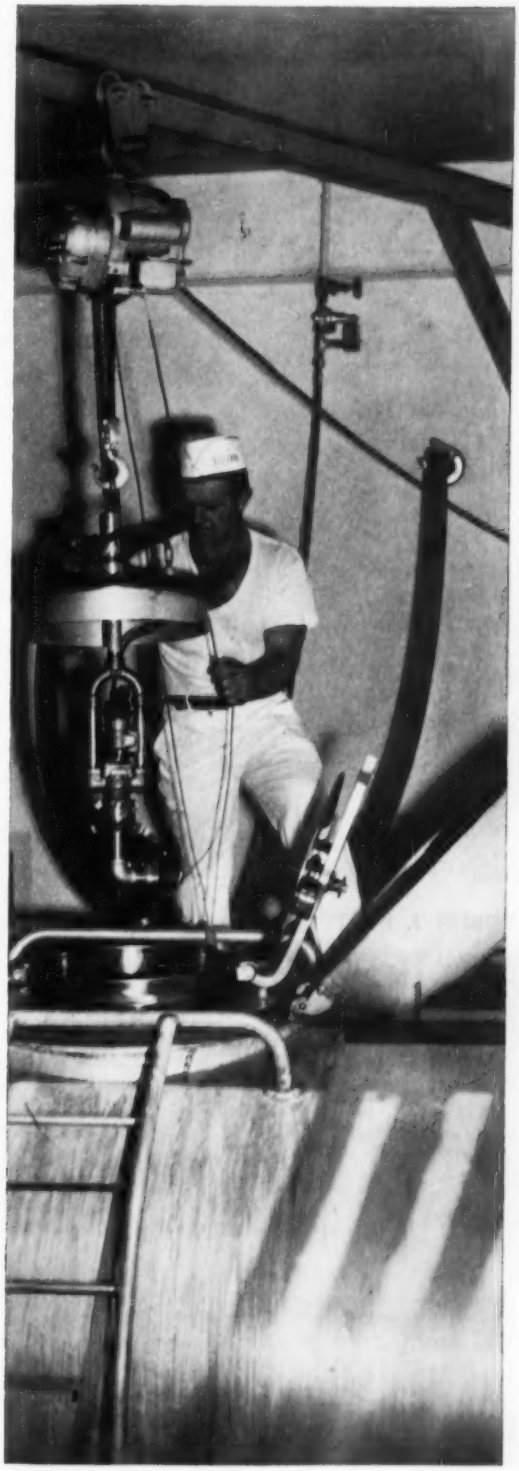
For the cleaning of the road-tankers used to bring raw milk to the plant, a second, 3-compartment cleaning solution tank, equipped with pumps and automatic controls, is located in the enclosed milk island adjacent to the plant. Cleaning cycle and materials used are identical to those employed in-plant.

However, a Lucerne-modified Seller's Roto-Jet spray is used. It provides complete coverage of tank interiors with its two-plane rotation. Regular swab tests are made of tanker interiors, and black-light inspection is used for the detection of milk-stone.



SPRAY HEADS for tank cleaning are perforated spheres that distribute solution over entire inside surfaces. They may be dismantled for cleaning by removing hasp that holds the halves together.

Tankers Cleaned-In-Place, Too



HEAVY ROTO-JET SPRAY is lowered into road tanker by electric hoist. Unit is powered by compressed air. As it rotates, solution is sprayed in both horizontal and vertical planes, giving complete tank-interior coverage.

Aluminum Cans?

Controversy rages over the 'miracle' metal's competitive ability, as three suppliers gear for production this Fall. But there's no argument about aluminum's advantages

QUICK-OPENING coffee can from Germany. It might go over big for specialty foods in this country.

ROBERT J. KELSEY

Assistant Editor, "Food Engineering"

TO PUT IT in one phrase—aluminum cans are ready to go . . .

This Fall, three U.S. companies will market limited lines of the light-metal containers. And their success—or failure—will be watched with keen interest, not only by the rest of the suppliers, but by the entire food industry.

First to hit the market will probably be an impact-extruded aerosol, produced by Victor Metal Products in a new, 32,000-sq.-ft. plant now under construction in Newport, Ark. Output, according to Victor Muscat, president, will be 120,000,000 cans per year.

Also in the picture is Kaiser Aluminum & Chemical Co., which is reported to be readying a 23,600-sq.-ft. plant for deep-drawn containers. And it's said to have already lined up a customer for 5,500,000 units. Identity of this customer is anybody's guess, since Kaiser isn't talking, and the best industry guess is that it's a major beer producer.

Continental Can Co., too, is cautiously throwing its hat into the ring, and will soon announce semi-production facilities for turning out test cans by three processes—impact extrusion, deep drawing, and an adaptation of the regular tin-can-making technique.

What's Behind It

Why all the new excitement over aluminum? There are three reasons:

- For the first time, aluminum production has outstripped its market. And producers are energetically looking for new ways to sop up the excess output.
- The can companies are irritated at the rising cost of tin plate. And despite the recent boost in pig aluminum prices, many experts believe that the price-tags on fabricated aluminum will tumble under the incentive of high production. This would give the can companies a substitute metal with which to needle the steel makers.
- Also, aluminum offers some genuine advantages as a can-making metal—from the standpoint of product protection, weight, printing, and merchandising appeal.

President Muscat of Victor Metals is the first to claim a competitive price for an aluminum can, declaring he will market his 6-oz. acrosol at $50 per 1,000—the same as competing tin plate cans—and make a profit on the deal.

At the other end of the scale is Aluminum Ltd., which just opened an automatic impact-extrusion plant for cans in Germany. Spokesmen for this firm assert that they can't see any chance for competition in the U.S. at this time.

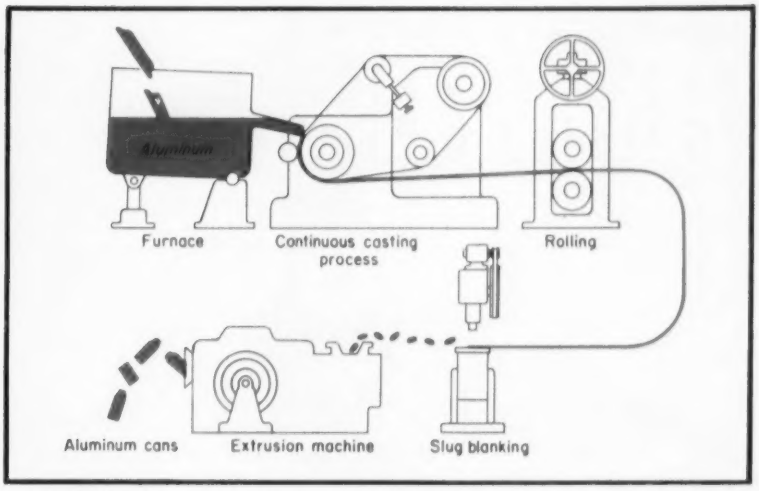
Continental Can strikes a middle position. While it does not consider the aluminum can competitive yet, it does think there is a market for the container at a premium price. Kaiser's views are not known.

There's no possibility, in any case, of aluminum replacing tin plate entirely—or even in large part—for a long time. Any radical shift to the "miracle" metal would severely strain production facilities—putting aluminum back in short supply.

Most aluminum boosters feel that the unique properties of this metal will draw it into special applications, where its product protecting advantages are strongest, or where convenience features—such as tear tape openers (see photo)—are justified from a merchandising angle.

. . . Here's What's Cooking

AEROSOL can is formed from little slug (right) by one blow in impact extrusion process.



AUTOMATIC can-making line, as seen by Aluminium Ltd., will start with molten aluminum, end up with printed can. Present line starts at extruder. The expanded set-up, this company feels, could make aluminum containers competitive.

There's no question about the decorative opportunities of such a can. Nor of it's lightness–about half the weight of a comparable tin package. There is a wide variety of products that can be packed in plain aluminum, too, and most of the rest can be accommodated in spray-coated containers.

Most promising application at the moment for sanitary cans–one that is being investigated by a number of large companies, and prominently by Adolph Coors, Golden, Colo.–is for beer.

Here, shelf-life of the beverage, reportedly, is doubled by aluminum. And shipping weight of the filled packages is cut 4½%.

But with any product, one problem that will take some real solving is the ease with which the aluminum cans are dented.

Strengthening ribs, easily applied during forming, should help. And possibly the aluminum alloys used in deep drawn cans will be less subject to this damage than the dead-soft metal employed in extrusion.

Profit By Impact Extrusion

The only thing more controversial than price is how to make the cans.

Victor Metals–backed by many years experience in making impact-extruded tubes (the company turns out 200,000,000 a year)–is planning to use a similar process for its cans. Preliminary costs are figured on a production of 110 cans per min., but President Muscat states that the line certainly can–and will–be stepped up to 240 per min. shortly after it gets under way.

How can such a setup compete with a 600-per-min. tin line?

The standard can line costs nearly $1,000,000, employs a great many people, and takes up a considerable amount of space.

Muscat claims he can cut the space, investment and depreciation, and labor problems. His entire can line, from extruder to five-color offset press–which he is ready to install in any food plant on a royalty basis–is only 30 ft. long, costs but $120,000, and requires only two men and a woman for operation.

Based on a market price of $35 per 1,000, here's what Muscat figures a canner would save by making his own aluminum cans:

Aluminum costs (78%)	$27.30
Labor (6%)	$ 2.10
Depreciation (1.5%)	$00.53
Overhead (8.5%)	$ 2.97
Profit (6%)	$ 2.10

Recently, he offered to install a 2,000,000-can-per-day plant in a large brewery, and calculated annual savings (over the price the brewer is now paying for tin cans) to be $1,235,000. Based on a 60,000-sq.-ft. production area and an invest-

EXPERIMENTAL cans–now in the works–include three-piece crown container (top), sanitary, seamless food can (bottom), and beer can.

"57" platform lifts easily for cleaning and lubrication. Note simplified lever system and ball bearing platform support, designed to absorb loading shocks and eliminate excessive wear on the pivots. Platform overhangs base to protect against dirt and dust in the lever system.

It's NEW . . . a 1000 lb. capacity portable beam scale, specially designed by Howe for its 100th anniversary! New features, rugged all-metal construction and dependability, new advanced styling—and a special anniversary price—mean more scale value for you with the "57!"

CHECK THESE FEATURES: full 1000 lb. capacity . . . solid cast iron platform . . . Howe's unique simplified lever system and ball bearing platform support . . . all metal pillar and cap . . . rugged, easy-rolling steel wheels . . . and you can choose the beam that's best for your weighing needs—standard single (100 x ½), double or full capacity.

The Howe "57" is the perfect low cost, all-purpose scale . . . simple, maintenance-free, sturdy, dependable, and above all accurate. Get all the details on the "57" today. Call your local Howe branch office, or contact

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ment of $2,124,000, the installation would, he says, pay for itself in less than two years.

Victor Metals' biggest gun is its exceptionally low price on the basic stock for impact-extrusion—the aluminum slug. Where most suppliers are quoting a price of 46c. a lb. for the little disk, this company claims to be able to sell it—at a profit—for 36c. Obviously then, the slugs will be even cheaper for Victor's own can lines.

In the impact-extrusion process, favored by Aluminium Ltd. as well as Victor, the aluminum disk is placed in an enclosed die and struck with a plunger, causing the metal to "squirt" up around the plunger and form a seamless can. Finishing operations include degreasing, trimming, and printing.

The top is double-seamed in place, after filling, with standard can-closing machinery that needs only slight modifications (roll grinding and tension adjustments) to handle the closing job.

Continental Can Co., which goes on record as positively not wedded to tin plate for its cans, but willing to try any metal that is economic and capable of mass production—is nevertheless not so certain as to the best method of making aluminum cans.

Hence, the company will make its prototype containers in drawn and three-piece models, as well as by impact extrusion.

In the first process, sheets of aluminum alloy are deep-drawn into the container shape. Three-piece cans are made by a modification of present can-making equipment.

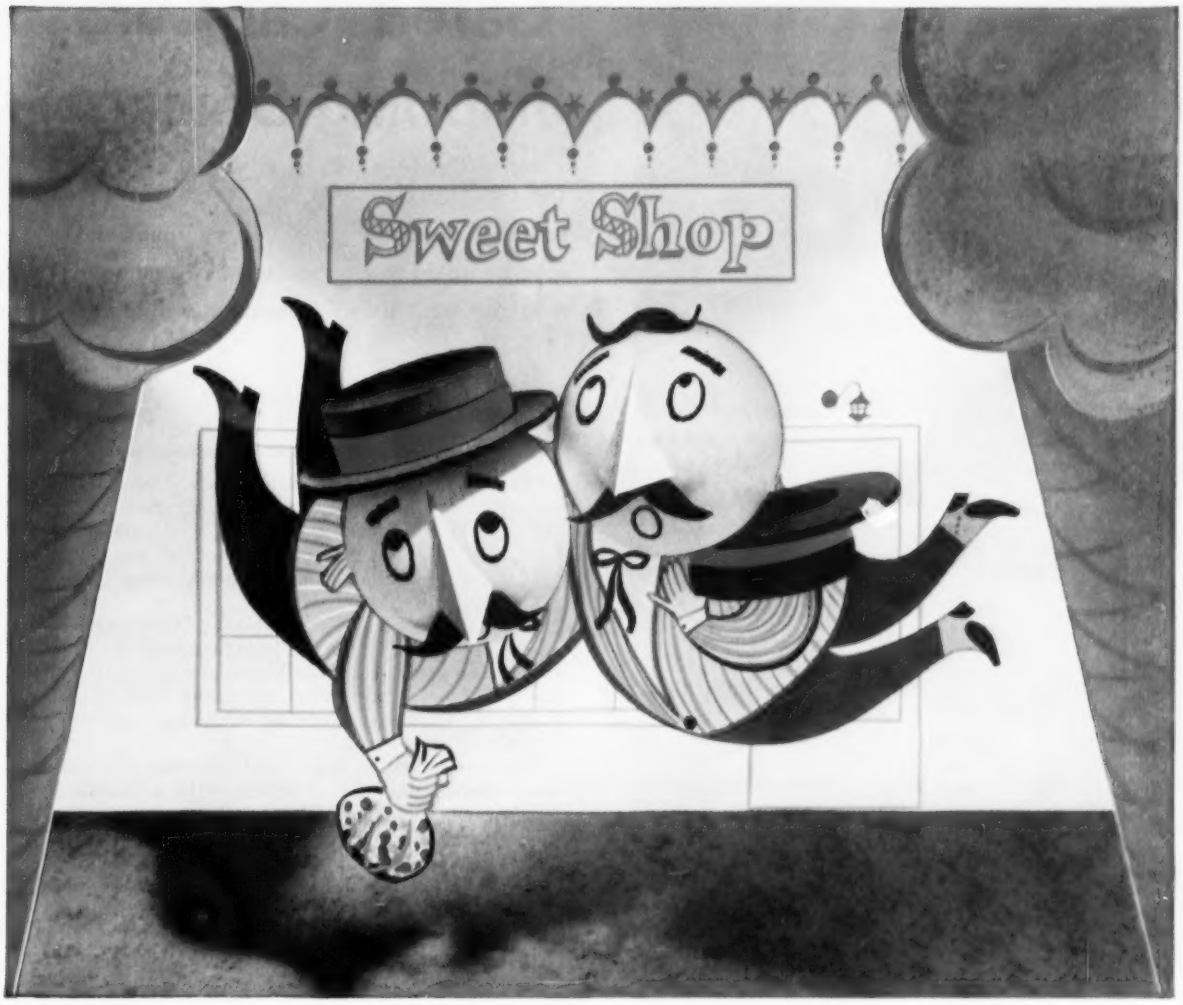
According to McGraw-Hill's *Business Week*, Kaiser will also use the deep-drawing technique. This company states that the alloy reduces wall thickness of the cans to 0.006 in. about half that of extruded models formed from dead-soft aluminum.

While aluminum-can production is now a hot subject in the U.S. it's really an old story in Europe, where the comparative prices of aluminum and tin plate are reversed.

Norway is the main producer, today, with annual consumption running about 32,000,000 to 40,000,000 cans per year (about 1,200 metric tons of aluminum). This country even exports some shallow-drawn cans to the U.S. for fishery products.

Germany has a sizable output for beer, soluble coffee, and vegetable oils. Switzerland's production is on the increase, going from 1,000 metric tons in '53 to about 2,000 in '56. Condensed milk containers account for 2,500,000 to 3,000,000 cans per year in this latter country. —*End*

DOW



Harmony for sweet sales:

Palatone and Cyclotene

Dow flavor intensifiers work well separately or together—giving added sales-appeal to ice cream, baked goods, candy and flavors!

Music to your ears! Referring, of course, to the sales reports you'll hear when you use Palatone® and Cyclotene® in your products. Both of these Dow aromatics accent flavor—and sales—appeal!

Palatone® is one of the rare flavor materials whose aromas closely resemble their tastes. Its distinct caramel-butterscotch odor emphasizes the sweetness of most blends. Palatone is also successful in compounding rich vanilla and chocolate flavors.

Palatone and Cyclotene® work very well together as flavor intensifiers. Cyclotene has a maple-licorice flavor, with a suggestion of walnut, which highlights the customer appeal of ice cream, baked goods, candy, tobaccos and peanut products.

Technical bulletins and samples are yours for the asking. You'll be sales ahead by writing on your letterhead to THE DOW CHEMICAL COMPANY, Midland, Mich., Dept. FC 869H.

YOU CAN DEPEND ON DOW

For more data, circle this page number on card at back →

'Gated' Car Curbs Shipping Damage

Loading and unloading of unit consignments sped by adjustable compartments. Dunnage is minimized. Simple operation a feature

NORRIS LOKENSGARD

Freight Claim Supervisor, Green Giant Co., Le Sueur, Minn.

A Both ends of car are quickly filled, six cases high. Note gate-locking slots (wall and ceiling).

B Gates (there's a pair at each end of car) are pushed tight against load, and then securely locked.

C Final load is stacked into doorway area between two pairs of gates.

TAKE A TIP from these photos. They show a brand-new gate-compartment way to ship cased goods so that they reach their destination in perfect, salable condition. Thus, the customers get better service.

This system has cut damage claims virtually to zero at Green Giant.

Employed in the new technique are "Compartmentizer"-equipped RR cars (Pullman-Standard) that cut loading costs, eliminate handling confusion at stop-off points, and save the receiver unloading time. Simple to operate, the compartmenting equipment costs little to maintain.

The cars encourage better load planning. They also either abolish dunnage or reduce it to a minimum. What's more, doors are wide enough to permit in-and-out movement of fork trucks.

To date, Green Giant has been using several hundred such cars, leasing some and securing others from various railroads. Leased cars are rented on a monthly basis with mileage allowance for distance traveled.

The compartmentizer is designed to divide the load into three parts, reducing load movement by at least a third. It comprises two pairs of gates that are permanently installed yet adjustable to fit the loads. One pair is set in each end of the freight car.

Each 4¼-in.-thick, 600-lb. gate is trolley-hung on a track that's attached to the side plate, and it can be moved easily by one man. The smooth surfaces of the gates generally precludes need of facer dunnage.

Both ends of the car are first loaded and gates tightly locked. Then the third section—the doorway area—is filled.

The loading operations merely involve stowing and locking, in contrast to the former three stowings and blockings at each end of a regular car. Further, there's no need to level the load.

In stop-off traffic, each consignee's load is protected behind a pair of gates, with the first consignment in the doorway. Thus, each stop's consignment is segregated, and gates can be locked or sealed as a safeguard against pilferage.

By putting two shipments in one end, the Compartmentizer can be adapted for "three-stop-and-final" service. In addition, it can be used for pool-car traffic, also for trans-load shipping. And, when required, a load-pickup routine can be followed. That is, an initial load can be stowed and gates locked, then further loads picked up and locked-in at subsequent stops. —*End*

New way to control Rancidification!

Antioxidant-impregnated cartons and wrappers protect flavor and aroma

Ionol, C.P. is an effective food-grade antioxidant. Impregnate boxboard and paper with it, and you protect aroma and flavor by preventing oxygen attack on fats right where it starts—at the surface of cartons and wrappers.

In actual tests, baked goods were stored at 85° F in Ionol, C.P.-impregnated boxboard cartons, which were found to be free of rancidity at the end of ninety days. Without Ionol, C.P. protection, packages of baked goods stored under similar conditions often develop rancidity within a week.

You can insure long shelf life and protection of your brand label's good name by asking for packaging materials containing Ionol, C.P. antioxidant. Write to Shell Chemical for names of suppliers of new Ionol, C.P.-impregnated packaging.

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SHELL

For more data, circle this page number on card at back →

High-Court Tips

LEO T. PARKER
Attorney at Law, Cincinnati

TO HELP YOU steer clear of costly legal battles—and also to aid in ameliorating those in which you may become unavoidably entangled—we detail here ten recent outstanding decisions of the higher courts.

All of them are most pertinent to operators in the food industry. Some relate directly to queries that FE readers have put to the writer. Others cover questions raised by foodmen at business gatherings he has attended.

Court references of specific cases are added (in parentheses at the end of items) for the further reference of those who may wish to delve deeper.

1. It's Your Risk as a Taxpayer

Recently, a higher court held that Although a delay in paying due taxes is not the fault of the taxpayer, nevertheless the latter must pay penalties for delinquency.

Our illustration is *Secretary of State* v. *Texas Frozen Foods*. Specifically, the company's '55 franchise tax of $2,508 was due, under the law, on or before May 1. And to cover it, the company sent the tax collector a check for that amount dated Apr. 30. Drawn on the 1st National Bank, it was received before the deadline by the Secretary of State.

However, the bank refused payment on the check, marking it "insufficient funds."

Actually, this was a bank employee's error, since the company really had on deposit more than sufficient money. Recognizing the mistake, the bank then paid the check. But this was several days after May 1.

Hence, the higher court held the company subject to lawful penalty for failure to meet the tax in time. The court said: "If a check is promptly paid when first presented to the drawee bank, then for all practical purposes the funds are as readily available to the taxing authority as if payment had been made in money.

"But if the instrument is dishonored when presented to the bank, it cannot be said that the taxes were paid at the time the check was received. The use of a check to pay taxes is always at the risk of the taxpayer." (299 s.w., 2d, 275)

2. Clutches of a State Levy

A reader asks: "If food products are shipped from one state to a purchaser in another, can an intermediate state levy a tax on this merchandise?"

Testimony in a recent case concerned certain goods shipped from Ohio and destined for a buyer in Wisconsin. Due, however, to a holdup in transportation, these goods had to be stored in Michigan for a time. And Michigan authorities taxed it.

However, a higher court subsequently held that it was not taxable by Michigan. It said the storing of it there while awaiting further transportation did not in any sense remove it from protection of Federal laws exempting merchandise in interstate commerce from state taxation.

Nevertheless, if either a consignor or consignee stops transportation of goods in a state for other than reasons of necessity, and especially for reasons beneficial to consignor or consignee, then the state has taxing jurisdiction over it.

3. Evil Instead of Anti-Evil

It has now been decided by a higher court that state laws are invalid and void if the testimony fails to prove that they are intended to prevent some offense or manifest evil relative to the public health, safety, morals, or general welfare.

In *Fairmont Foods* v. *Attorney General* it was shown that a statute restricted wholesalers of food products relative to the furnishing of advertising matter to retailers, also concerning certain payments for storage or display of foods, and in connection with making loans to retailers.

This statute was termed invalid by the court, which declared: "We conclude that the laws are arbitrary and unreasonable restrictions upon lawful business practices." (81 N.W., 2d, 639).

4. Legality in Safe Canning

A reader writes: "What are the legal safety responsibilities involved when packing freshly roasted and ground coffee in cans?"

A check of cases shows that a negligent coffee packer is liable in damages for injuries caused by explosion of a can or jar containing the coffee.

Court testimony has shown that the roasting preparation of coffee from the green beans there are generated large quantities of CO_2, CO, and some aromatic gases. If the beans are solid, waxy, and of recent picking, pressures up to 160 psi. can be developed in their structure, especially if the coffee is roasted rather dark.

If the coffee is not ground, it will take from six to seven days for the pressures in the interstices of the whole bean structure to reach zero gage pressure. Hence, the finer the coffee is ground, the quicker the

For Avoiding Legal Tangles

gases escape. For example, a drip-grind coffee will de-gas to zero pressure in about three days.

Experience with safe practices indicates that roasted coffee should be allowed to de-gas in the bean for about two days prior to grinding and vacuum packing in cans or jars.

Failure of a processor to follow such well-known practices can lead to container explosions, and the courts will then hold him liable for injuries caused.

5. Presidents Are Targets, Too

Last month, a high court held that the president of a corporation may be personally liable for shipments of adulterated foods.

In this case, *Lelles* v. *United States*, a company and its president were charged with unlawfully introducing into interstate commerce at Seattle, for delivery to persons in Iowa, a number of cartons containing "cultured mushroom salt." Federal authorities contended that the product was adulterated in that it contained insect larvae and fragments.

It was argued in defense that the president of the company couldn't be liable because he himself didn't ship the goods.

Nevertheless, the court held him personally liable, saying: "We believe the import of the statute is that a person who has responsibility in the business activities of a corporation may be personally liable. It would seem from reading the statute that if a person causes the unlawful introduction of adulterated food into interstate commerce, such a person is guilty." (241 Fed. Rep., 2d, 21)

6. Price Tangle in P. R.

Discussion has arisen over the question: "Is the law of a U.S. commonwealth valid when it taxes or controls the selling price of merchandise?

A few weeks ago, a higher U.S. Federal court answered this question by holding such a law invalid if it deprives manufacturers, processors, or sellers of reasonable profits.

The case was *Enrique Mora* v. *Felx Mejias*, wherein testimony showed that Order 228 of the Secretary of Agriculture & Commerce of Puerto Rico fixed the importers' maximum wholesale selling prices for rice of superior and good quality at $12.90 and $12.25 per 100 lb., respectively.

Since the importers' contracts with the continental mills were written at higher prices, this order definitely required all the Puerto Rican importers to sell rice at less than cost.

In holding this portion of the order invalid, the court said:

"It is well settled that it is a deprivation of property without due process of law for a state to compel a public utility to continue to operate at a loss. Concededly, the effect sought by the Secretary was eventually to bring down the prices in the continental U.S., but in his judgment it had to be accomplished by imposing a loss upon the importers in the interim.

"We think it was arbitrary under the circumstances of this case to compel the rice importing industry to sell at a loss."

On the other hand, this court held valid the portion of Order 228 applying to rice that importers had purchased at the lower prices and which, under the order, they could sell at a reasonable profit. (223 Fed., 2d, 814)

7. "One Good Extinguisher"

Warehousing aspects and angles can generate many legal questions.

Of course, it's well known that the higher courts hold warehousemen liable for loss, destruction, or damage to stored foods when the blame can be laid to negligence of their employees.

Now, a new high court decision—one unusually important—has been rendered. In brief, a warehouse company has been held liable for

---

? How Many of These Questions Can You Answer ?

Run through them and see. Then for a check on your "score" read this revealing article. It details all the actual cases and tells the decisions reached by the courts.

- ★ **Are you 'in the clear' when you can prove it was really the bank that goofed?**
- ★ **When your food shipment is delayed en route, can you be taxed by the state in which it's held up?**
- ★ **Must you be bound by an offensive law that prevents no offense?**
- ★ **How can you avoid suits over "hazardous cans?"**
- ★ **Can you be held personally liable as firm president?**
- ★ **What's the legal recourse when a law prices you out of your profits?**
- ★ **What's your liability after your fire extinguishers failed to work?**
- ★ **How can liability extend past your property line?**
- ★ **What factor is most pertinent in a suit over advertised claims?**
- ★ **How should you draft a contract so that its wording won't be held against you?**

full fire damage to stored foods on the testimony that fire extinguishers in the warehouse were defective and inoperative. *Colonial Transfer & Warehouse Co.* v. *Southern* was the case.

It was related here how $24,000 worth of merchandise was destroyed in a fire that started in the warehouse two hours after the general employees had left the building.

Thereupon, the company that had owned the goods sued the warehouse for their value, proceeding to prove that several extinguishers on the premises were out of working order, not having been inspected and refilled periodically.

In view of this, the court held the warehouse liable for full value of the burned merchandise.

It said: "The jury was privileged to believe testimony of witnesses that one good extinguisher would have been sufficient to control the fire, and two would have been sufficient to quench it." (88 So., 2d 289)

8. Goes Beyond Property Line

Another late high court decided that a warehouseman who was negligently at fault for a fire that destroyed his warehouse was liable for more than the value of lost goods: He was also liable to the insurance company that paid the claim of an owner of adjacent property destroyed by spreading of the same fire.

This situation was recounted in *Union Warehouse Co.* v. *General Insurance Co.* Union had combustible goods stored in its warehouse. And due to negligence of the employees in not regularly inspecting the premises, a blaze started.

As stated, another building next to the warehouse, and of different ownership, was also lost, along with its store of insured food. The insurance company, after it had paid for this latter loss, sued the warehouse organization, charging that negligence of its employees had caused the original fire. It argued that the warehouse was therefore liable for the damage next door.

Agreeing with this contention, the court held the warehouse company liable to the insurance company for the several thousand dollars of damages sustained in the adjacent structure. (143 Fed., 2d, 128)

9. He Read It Too Late

At a recent gathering of food corporation executives, this question was put to the writer: "Suppose a warehouse company advertises its building as 'fireproof'—and then the structure burns down. Can a food man who thus loses his merchandise find legal recourse in the argument that there was failure to live up to the advertised claim?"

The answer is: "That all depends."

Take the higher court decision in *Gaines* v. *Cody Warehouse Co.* It was shown here that Gaines, after contacting a warehouse advertised as being "fireproof," stored food in it, and then later the building was lost in a fire.

Gaines promptly sued for full value of his destroyed goods on the grounds that the warehouse was responsible since its newspaper advertisements—as well as the receipt received by him—asserted the building was "fireproof."

Testimony showed, however, that Gaines hadn't actually read the advertisements before delivering his goods to the warehouse. Nor did he have prior knowledge of the printing on the receipt.

Therefore, the court decided the warehouse company was not liable, since Gaines had not demonstrated that he had cognizance of, and placed reliance upon, the claim of the building being proof against fire when placing his goods in it. In short, Gaines had not proved that this claim on the part of the warehouse had been a considered factor in his move.

As the court put it: "In support of his position, the plaintiff (Gaines) contends that the defendant (the warehouse company) represented the warehouse to be fireproof when, in fact, it was not, and which fact was unknown to the plaintiff."

Regarding the receipt—which Gaines got in the mail several days after the acceptance of his goods into storage—the court declared: "There is nothing in the evidence to indicate that the plaintiff relied upon the words 'Fireproof Warehouse' in the receipt and contract mailed to him. The goods had already been stored prior to the time he received the form in the mail."

So in such cases it's established that the warehouse is not liable—unless it is shown that the owner of the merchandise has actually read and relied upon such advertised statement before allowing the warehouseman to take possession of his goods. Similarly, proof of prior cognizance and reliance would be required relative to the receipt. (263 Pac., 2d, 252)

10. Ambiguous Satisfaction

Employment contracts were the concern in another late high court decision. Here it was brought out that a company that's dissatisfied with an employee's services must prove its case—otherwise the employee may recover damages on the contention of violation of the contract.

In point is *Armfield* v. *McClure Co.* Armfield, in this case, was a representative under verbal contract to McClure, a food broker. He was to receive from McClure 40% of the gross commissions on all business from buyers in a specified territory.

Later, Armfield told McClure that he intended to go into business for himself. But company officials were able to persuade him to remain in McClure's employ under another contract, this time written.

Contained in this signed contract was a clause to the effect that McClure guaranteed Armfield $5,000 a year "as long as he covers the territory in the manner it has been handled and obtains satisfactory results as prior to this agreement."

Soon after, however, a disagreement arose. Company officials alleged that Armfield's services were generally "unsatisfactory," and then they discharged him. Thereupon, Armfield sued for substantial damages.

Holding in favor of Armfield, the court said: "The contract is clearly open to a construction that the guarantee of a minimum monthly payment of $416.67 was the inducement that led the plaintiff to sign that instrument and remain in the defendant's employ. Since the contract was written by the defendant, the language adopted will be given its ordinary meaning and be construed more strongly against that party." And here the court cited authorities upon which it based its evaluation of the wording.

In short, although the salary guarantee, as contracted, was dependant upon Armfield "obtaining satisfactory results," the court felt that McClure had written a very ambiguous clause, and so should bear the responsibility attendant on it.

Hence, it held against McClure, notwithstanding the fact that company officials were dissatisfied with the representatives results. (75 Atl., 2d., 196)

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In Canada: 57 Bloor Street West, Toronto, Ontario

AT JOHN DULANY wirebounds have saved $100,000 over the past three years—just by replacing bushel hampers. As shown, bulk loads of green beans are now automatically dumped from pallet boxes into a hopper that feeds a processing line. These versatile carriers have also reduced the product-handling crew from 30 to 8 men, and have made more efficient use of storage space.

WIREBOUND PALLET BOXES

—'57 Way to Cut Produce-Handling Costs

Versatile bulk-handlers eliminate filling and emptying delays, curb product damage, boost storage efficiency. Sturdy and capacious, they pay for themselves in short order.

FE STAFF

TODAY, there's a fast-moving trend toward wider use of wirebound pallet boxes for bulk-handling of produce. The reason: Cost-cutting versatility of these sturdy units.

In fact, they are continually being adapted to a greater variety of items and top-efficient handling methods. We will detail their latest applications, but first, a look at the techniques:

Products handled: Notable savings have already been effected in handling of green beans (FE Feb. '56, p. 74, and Dec. p. 74), potatoes, and cucumbers.

Currently, these boxes are successfully used for apples, citrus fruit, onions, garlic, radishes, carrots, and sweet potatoes.

Furthermore, they've been found very suitable for light and heavy loads of melons, cranberries, corn, beets, turnips, cabbages, lettuce, broccoli, spinach, and other leafy greens.

Handling methods: Basically, the bulk carriers are designed to simplify and improve four key food operations —harvesting, shipping, storing, and processing.

In harvesting, this technique abolishes costly and easily damaged bags, hampers, and picking boxes. What's more, the new units simplify inspection of products—whether harvested mechanically or manually.

Advanced handling methods take over when spuds, for example, are mechanically harvested directly into wirebounds loaded on flat-bed trucks. Items are then lift-truck transferred for shipping or warehouse stacking. Boxes with capacities to 1 ton are easily filled by one man and handled by another.

In another instance, efficiency of a new mechanical bean harvester (Chisholm-Ryder) has been stepped up by handling twin-box loads in the field. This harvester processes about an acre an hour, replaces 50 pickers, and does a much better job.

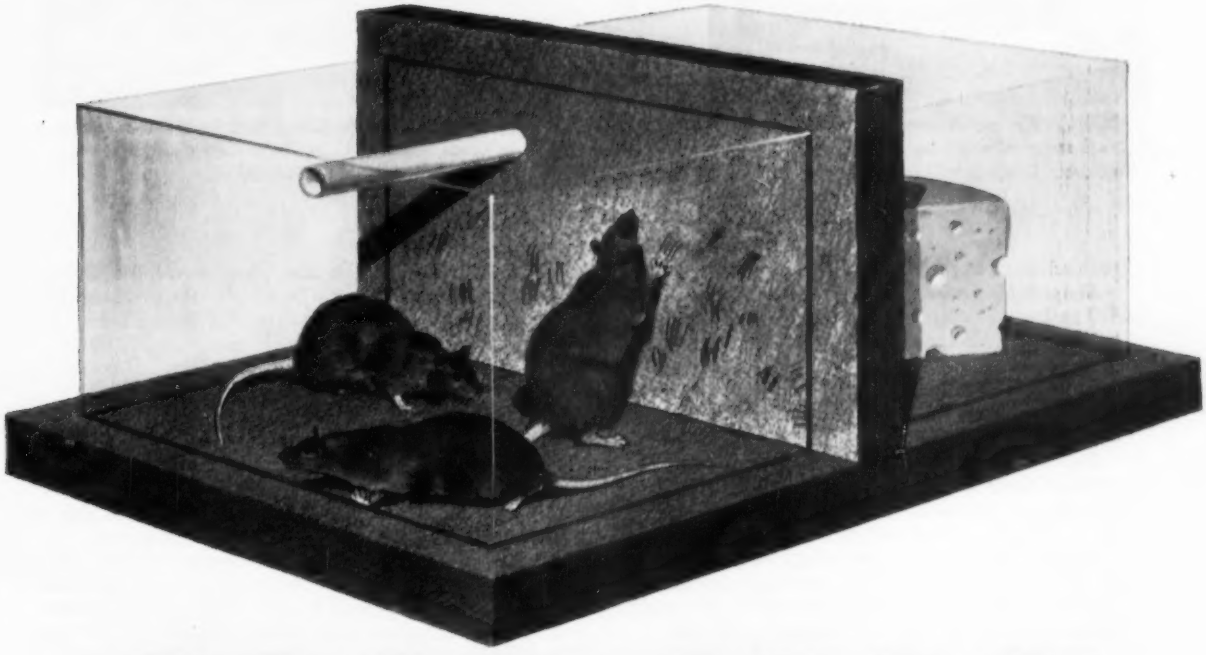
Shipping economies: Use of the pallet-box method has sharply reduced labor requirements, dunnage, product damage, and waste.

Now, one man operating a lift truck replaces a crew of 10 to 20, and quickly loads or unloads cars or trucks. This, in turn, cuts the idle time of transit equipment.

And with multiple handlings eliminated, products arrive in better shape. Spoilage is minimized by the boxes' special construction, and quality is further safe-

Turn Page for 18 Revealing Case Histories →

Rats gnaw right through some insulations . . .



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Wirebounds Aids . . . Harvesting

POTATOES are mechanically harvested directly into these truck-mounted pallet boxes in Aroostook County, Me. Units are later handled by lift-truck.

. . . Storage

MOBILE RIG grades spuds and loads them into wirebounds at Farr Farms, Greeley, Colo. Tubers are stored and shipped in same boxes, which hold 2,500 lb.

guarded because there's no shifting of loads in transit.

Simplifield storage: Lift trucks now quickly unload 500 to 2,000-lb.-capacity units and stack them to ceiling height. Boxes are specially designed for stacking five or six high.

Processing advantages: Boxed loads are easily and speedily discharged into hoppers feeding canning, freezing, and prepackaging lines.

Bulk unloading is now carried out in a variety of ways. One is to transfer pallet-box loads by lift-truck onto a roller conveyor. Latter feeds a hydraulically operated dumper, thus frees the truck for other tasks.

Another method is to feed the load directly to mechanically or hydraulically operated dumping devices.

And still another is to use a lift-truck with a rotating head—especially in areas with limited headroom.

Box Types, Capacities

Specifically, there are three basic types of wirebound pallet boxes—exterior cleat, for heavy bulk loads; interior cleat, for lighter loads; and expendable, for economical one-trip use.

"One-time shippers", constructed from resawed hardwood and reinforced by galvanized steel wires, are designed for loads up to 1,500 lb., and for four-way entry by the lift-truck forks. Addition of wooden blocks at each corner permits stacking prior to shipping and, with proper dunnage, in transit as well. Shipped knocked down, boxes are easily assembled by one man.

Exterior cleat-type boxes, made of hardwood slats and reinforced by heavy steel wires, are also shipped knocked down. They are especially suited for loads ranging 1,500 to 2,200 lb. Two- or four-way entry skids permit lift-truck handling.

On certain of these boxes, double-mitered cleats and special double wire closures (Generaloops, tradename of General Box Co.) are used to give maximum strength to corners. These loops can easily be clipped to collapse the box for off-season storage or return shipment, and are quickly replaced when box is re-assembled.

Third type is of hardwood slats with inside cleats and steel wires. This kind is used primarily for 700 to 1,200-lb. loads, and will withstand stacking loads of 2,500 lb. Sturdy skids also allow easy fork-lift entry and simplify stacking. Boxes are shipped knocked down, approximately 350 to a RR car and 250 per truckload.

18 CASE HISTORIES

Now for a roundup of how and where these labor-, space-, and time-saving containers are being used.

1. At John H. Dulany & Son, Fruitland, Md., they've permitted impressive cost cutting. In one season, more than 31 million pounds of raw vegetables were transported from grower to processing line in wirebound pallet boxes—which paid for themselves after eight trips.

These boxes have now been in rugged use for three years, most of them remaining in good shape. Handled properly, they are expected to average over 100 trips.

Pallet-box operations eliminated the need for a flat truck and 10 workers during a season's harvesting of 190 acres of flat beans. What's more, this firm was able to reduce its raw-product-handling crew in the cannery from 30 to 8 men.

Significant, too, were capacity gains in storage areas. Formerly, they held only 7,900 bu. of beans in hampers. Now there's room for 11,800 bu. stored in pallet boxes stacked four high. And it takes a man only 14 min. to unload and reload a truck with empty pallet boxes.

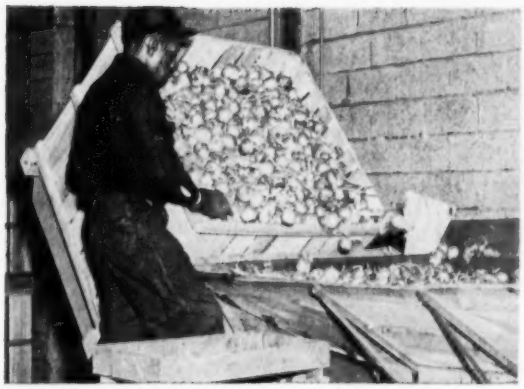
This cannery estimates that pallet-box handling of produce saved $100,000 over the past three years just in eliminating the old bushel-hamper, which required frequent replacement.

2. At The Larson Co., Green Bay, Wis., green beans are mechanically harvested into bags. However, consideration is currently being given to mechanized pallet-box loading in the field.

After beans are cleaned and loaded into pallet boxes, they are transported to the company's warehouse. Here, boxes are temporarily stacked four high in refrigerated rooms.

When scheduled for delivery to the cannery, 22 pallet boxes (700-lb. capacity) are loaded onto a trailer truck, two high. Almost 500 such boxes are shipped

. . . Processing



BULK LOADS OF ONIONS are mechanically dumped into a hopper that feeds a pre-packaging line at a large East Coast plant.

. . . Shipping

FLORIDA ORANGES are bulk-handled in this shipment to northern pre-packers. Pallet boxes are being stacked three high in reefers.

daily in this manner, unloaded by lift truck, and returned.

Because of limited headroom, a dumping device could not be used. However, this problem was easily solved by use of a lift-truck with a rotating head (Clark), and special pallet boxes (designed by General Box Co.)

Base of this particular pallet unit has three sturdy stacking strips securely bolted to the skids. These supports take up the shifting load as boxes are rotated 360 deg. for dumping.

3. A pickle packer in North Carolina has just completed his first year of bulk-handling cucumbers in wire-bound pallet boxes. Now only 9 men (instead of 36) handle yard loading and unloading.

4. Farr Farms, Greeley, Colo., supplies potato chippers with top-quality spuds carried in exterior cleat-type boxes. Potatoes are field-graded (by a mobile unit) directly into 2,500-lb.-capacity units. A lift-truck transports them into dugout farm-storage buildings, where they are stacked three high to await winter and spring shipments.

Loaded boxes are placed on flat-bed trucks and hauled to customers, sometimes with drop shipments at several chippers' plants. Special wire closures (previously described) are clipped from empty boxes, which are then knocked down for return shipment.

5. Red Dot Foods, Inc., Madison, Wis., a longtime pallet-box user, recently switched its potato-storage technique to pallet-box handling at its Indianapolis potato-chip plant. Now it easily handles over 1,000 bags of potatoes bulk-shipped to a RR siding alongside the factory.

Spuds are chuted from rail-unloading dock into the basement where, through use of a company-built, hoist-mounted hopper, they are gently transferred into pallet boxes. Transfer hopper consists of a series of horizontal rubber fingers that lower the potatoes through hopper and into boxes. Hopper is electrically hoist-elevated by pushbutton as boxes gradually fill up.

Exterior cleat-type boxes are stacked three high to ceiling height. Company reports doubled storage capacity due to closer, sturdier, and higher stacking with pallet boxes.

6. At H. J. Steane Co., E. Hartford, Conn., pallet-box shipping has enabled tighter quality control in pre-packaging of Maine potatoes. Now, a double-grading system is employed in packing 5-lb. polyethylene bags.

Formerly, spuds were Maine-packed in 50-lb. polyethylene bags and RR-shipped to the E. Hartford plant for re-packaging.

Vice-President R. F. Grant felt that breakdown of potatoes could be reduced by bulk-load shipping. He also estimated that if 200 boxes could make 15 trips, they'd cost, as containers, a mere 5c. per cwt.

Spuds for Steane are now shipped from Maine, after they are washed and graded directly into 2,000-lb-capacity boxes. A lift-truck then transfers 20 loaded units into insulated box cars.

Arriving at E. Hartford, boxes are unloaded and stacked by lift-truck in two-tiered rows inside the packing room. Here, the truck places a pallet box in a hydraulically operated unloading device that dumps potatoes onto a grader to insure a premium pack.

7. Refrigerated RR shipment of potatoes in pallet boxes, from Maine to Philadelphia and Washington, started over a year ago. Car unloading takes only 40 min., and spuds arrive in better condition.

8. Idaho potatoes have found their way into wire-bounds in several grower operations. And others are carefully considering this method for the '57 harvest.

9. In Newfoundland, there's interest in using pallet boxes to deliver spuds to ships.

10. Button radishes have gone the pallet-box way at Sarasota, Fla.

Radishes are automatically dug, topped, and loaded into burlap bags by a small harvester. Bags are then picked up by a mechanical grader and dumped into a hopper. A machine, drawn by a flat-bed truck loaded with empty pallet boxes, grades the radishes and elevates them into a chute, filling one box after another (17-18 bu. each).

The truck then hauls the pallet boxes into a wash house. Here, the boxes ride a conveyor to a dumping device that discharges their loads into a hopper. Cleaned, washed radishes then proceed to the pre-packaging line.

11. Onions are being handled and stored in 1,500-lb.-capacity pallet boxes stacked five high by an East Coast grower. Bulk shipped to a New Jersey pre-packaging plant, loads are fed directly to production lines with use of a speedy dumping device.

12. Bulk loads of garlic and onions are also being efficiently handled with use of pallet boxes in California.

13. Citrus fruits—(oranges and grapefruit) have been bulk-shipped in wirebounds by a large food chain for the past year.

From Florida and Texas

Florida citrus is trucked in pallet tote boxes from the Lakeland area into the Washington, D.C., market for pre-packaging. Several hours later, it's whisked to nearby supermarkets.

Another branch of this chain recently started shipping the fruit by pallet box from Texas to such outlying markets as Denver, Colo., and Kansas City, Mo.

Results: Fruit arrives in top condition. Temperatures of bulk loads are better controlled. Loading and unloading are sped. And less labor is required.

"Most noteworthy progress! Now we'll be able to keep K-Rations forever!"

14. Some Michigan apple growers have switched from harvesting apples in 1-bu. crates to the bulk system.

Boxes are strategically spotted in orchards by tractor lifts. Pickers move these lightweight units close to the trees, and fill them with 15 bu. of apples. The lift then hauls boxes to trucks, where they are stacked two high for speedy transfer to nearby cold storage warehouses.

One man now handles 15-bu. loads—a task formerly requiring a crew of workers carrying separate crates.

15. An Ohio canner receives Michigan apples in pallet boxes, and disassembles the boxes for return shipment.

16. B. F. Trappey & Sons, Lafayette, La., received several carloads of sweet potatoes handled in pallet boxes during the '56 harvest. This cannery, too, experienced notable success in handling and storing this item.

17. Texas carrots have been harvested into pallet tote boxes and mechanically dumped in packing plants. Slatted sides of boxes permit hose pre-washing of carrots while still in wirebounds. Boxes are unaffected by water spray or icing, which sometimes have to be applied during storage.

18. A Cuban canner is considering pallet boxes for handling of pineapples. —*End*

New Bacterial Culture Medium

Prevents Cheese Failures

Discovery in Ireland leads to method for instilling resistance elements . . . The payoff: An end to elaborate phage control work

SYLVIA LAVERTON
Fellow, Royal Institute of Chemistry, London, England

CHEESEMAKERS can now "see daylight" after their long, dark bout with bacteriophage.

For the new Phage Resistant Medium (PRM) will grow starter cultures that will make high quality cheese even when bacteriophage contamination is heaviest.

PRM is a calcium-free neutral medium produced from milk as a white spray-dried powder.

It was discovered by Bruno Reiter, a scientist working in the research laboratories of Fisons Milk Products, Ltd., Coleraine, Northern Ireland. And it was then developed in collaboration with Britain's National Institute for Research in Dairying.

The product has proved effective in widespread factory tests, including trials in New Zealand and Australia.

Research Leads to Answer

Vital role of calcium for multiplication of lactic acid phages was found by Reiter in 1949. But the practical problem of designing a calcium-free medium that would starve the phage, and yet allow starter bacteria to grow, was not easy to solve. PRM made from milk has proved to be the answer.

Phage will not multiply in PRM that has been dissolved in distilled water. And those present initially will die. Meanwhile, a great many of the starter strains commonly used in cheesemaking, including those for cheddar and cheshire, will grow well in the solution.

It is predicted that the PRM will free cheese producers from many of the elaborate precautions now required in the effort to control phages, which have caused losses running to 5% of output in all major cheese-producing countries.

Cure-and-smoke process turns out

Improved-Quality Turkeys

Method full detailed, along with bird-holding data and weight factors . . . Operations require well-equipped dressing plant, curing facilities, smokehouse, walk-in cooler and freezer

H. R. MALCOLM and J. G. WOODROOF

Respectively, Assistant Food Technologist and Chairman, Food Processing Division, Georgia Experiment Station, Experiment, Ga.

YEAR-'ROUND consumption of turkeys was made possible by freezing techniques. And now there is an important further stride—curing-and-smoking of the birds.

Our tests, over a 3-yr. period, indicate that this process extends storage life of the turkeys beyond that of the frozen product.

And there is the prime fact that the cured-and-smoked gobblers have exceptional consumer appeal.

The bright picture offered by this type operation is evidenced by a check. We served both smoked and ordinary frozen turkey samples to 100 consumers—67 men and 33 women. And 85% of the men and 58% of the women chose the smoked product.

Five reasons may be cited for this preference:

1. **Aroma and flavor of hardwood smoke transform the birds into an extra-delicious specialty.**
2. **Firmer, smoother, and more uniform texture makes them easier to slice.**
3. **Light-pink color of breast meat and mahogany hue of the dark meat make for a richer, more appealing product.**
4. **High quality is better retained—due to lower moisture content of the meat and antioxidant and bactericidal properties of the smoke.**
5. **Natural aging, during curing and smoking, tenderizes the meat throughout the bird.**

How You Do It

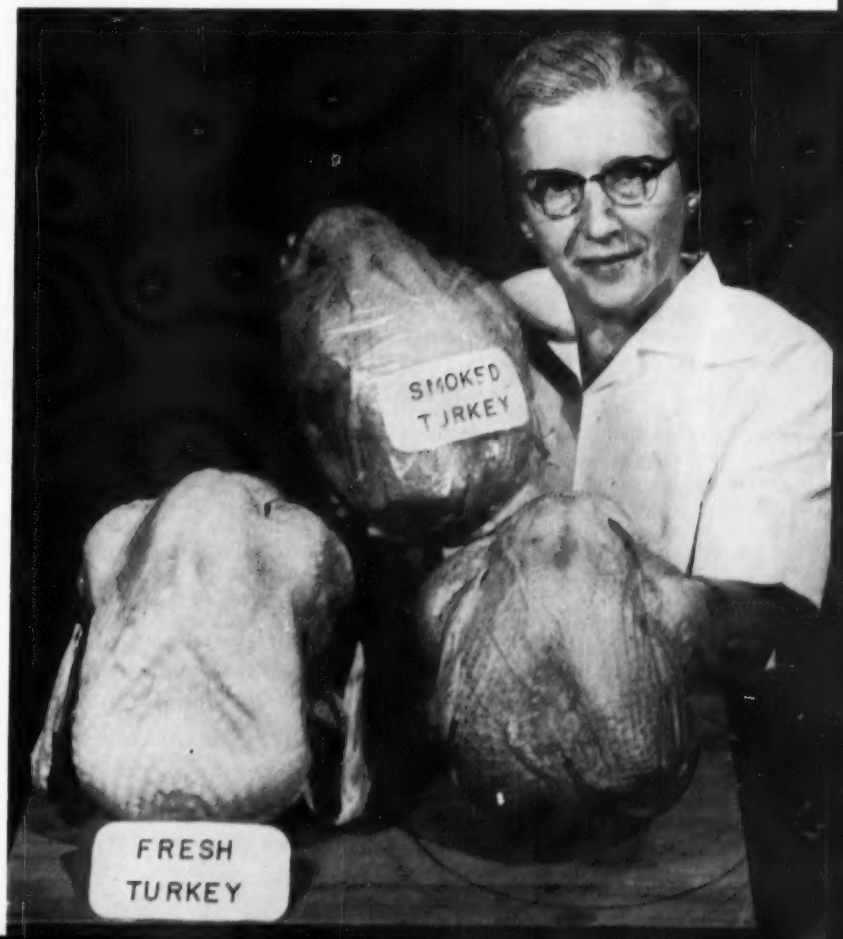
Although any size turkey can be cured and smoked, 'well-finished' 6-mo.-old birds weighing 26 lb. (live weight) are preferable. Live turkeys should be carefully handled.

They should be hung by their feet for killing, bled thoroughly, and scalded in 126-to-128F. water having a trace of detergent.

Next, head and feet are removed and discarded along with the feathers. The neck is cut off close to body, leaving skin as unbroken as possible. Then the cleaned turkey is eviscerated.

Gizzard, liver, heart, and neck can be used fresh, or packaged frozen.

Pinfeathers are finally removed. And after the carcass is washed in



SMOKED TURKEYS are in the specialty class due to their fine aroma, flavor, and color characteristics. They are of firmer texture and easier to slice. And they keep longer.

WHAT the ready-to-serve bird looks like, when properly cured and smoked-cooked, is seen at (1). Indicated at (2) is area to watch for spoilage. And (3) shows skin-mottling due to insufficient drying before smoking.

cold water it's trussed, as for roasting.

Your curing may be begun immediately after dressing, after chilling, or following freezing and thawing.

In any case, completely immerse carcass in a solution made by dissolving 6 lb. of salt, 3 lb. of sugar, and 3 oz. of saltpeter in 4½ gal. of water. Chill this solution to 38F., and hold it there throughout your curing.

Using a 50-gal. barrel, you'll need about 20 gal. of cure to cover five 18- to-20-lb. birds. Note that the container employed here should be non-corrosive (hardwood, crock, or stainless steel).

Medium sized (21-lb.) turkeys take six days to cure. Smaller birds (14-lb.) cure in four days, and larger ones (25-lb.) require seven.

During curing, the carcass should be as 'open' as possible so as to give maximum contact with the curing solution. Likewise, the birds should be rearranged at least once while in the cure.

Excess salt is removed by washing cured birds in three changes of fresh water, or by spray washing with a hose. However, the cavity must be thoroughly rinsed. To drain cavity water, hang birds breast-down. Afterward wipe inside and out with a clean, dry cloth.

Now insert the turkeys in stockinettes and hang so the cavity continues to drain. Then complete the removal of surface dampness by suspending turkeys in a room served by rapidly moving, dry air—making sure that the air circulates through cavity and between birds.

Rate of surface drying depends on temperature, relative humidity, and movement of the air. Average time is about 4 hr.

Smoking to Color

Usually, the birds are smoked in the same room (without moving them). This is accomplished by raising the temperature of the air to the desired degree, reducing amount of circulation, and admitting smoke.

Discontinue ventilation until proper temperature and smoke concentration are reached. During smoking, circulate just enough air to keep it well mixed. This prevents stratification.

Smoking at 150F. for about 18-hr. gives a mildly precooked product, with well distributed, cured-and-smoked aroma and flavor.

The finished turkey is compact, smooth, firm, and egg-shaped, with a glossy light-brown color. Breast meat has the attractive light-pink color, while the dark meat has the shade of well-cured ham. The salt content runs about 4%. And the moisture ranges from 57% (dark meat) to 61% (light).

These smoked-cooked turkeys may be (1) sliced and served without heating or additional seasoning; (2) heated, sliced, and seasoned according to individual preference; or (3) used in combination recipes.

Smoking at 115 to 125F. for 48-hr. results in an uncooked product with a fairly uniform, dark-brown color and attractive sheen. Here, the salt content is 3.4%, while moisture runs around 59% (light meat) to 66% (dark).

The smoke aroma and flavor of these birds are much more pronounced than in the smoked-and-cooked product. The birds can be roasted with or without stuffing.

Smoking uncured turkeys is impractical, since the moisture content is too high for the smoke to penetrate. Furthermore, the beneficial effects of the salt and saltpeter are realized only by curing before smoking.

Equipment Needed

Reducing the routine to the simplest operations, curing and smoking of turkeys may consist of dry-picking of the birds by hand, removing excess parts, placing immediately in a barrel containing cure, and then smoking in a barrel.

However, for saving labor, reducing costs, and assuring maintainance of proper sanitation, a well-equipped dressing plant is necessary for processing salable birds.

A walk-in refrigerator is needed for chilling birds during curing and after smoking. Also required is a walk-in smokehouse at least 4-ft. square, as well as a 0F. storage room for holding frozen turkeys.

Equipment such as employed for curing and smoking pork and for freeze-storage in locker plants has been found adequate. And of course there must be facilities for killing and dressing the birds.

Several types of smokehouses are satisfactory: The all-metal portable smokehouse with gas burners under a sawdust tray; the masonry walk-in type with gas burner and sawdust trays; and the masonry structure with a 6-in. pipe flue from a nearby wood-burning furnace.

Whatever the structure, provisions must be made for controlling temperature in the smokehouse, for circulating air, and for quickly ventilating the house after smoking is completed. Care must also be taken to see that the turkeys are not hung directly above the fire, since the melted fat may ignite.

By refrigerating the smoked turkeys, you help prevent loss of desir-

able color, aroma, and flavor during storage.

It is possible to hold smoked turkeys without refrigeration for several days. But they can be held for more than a week at 50F. or lower. And even as long as two months at 32F.

For lengthier periods, they should be well wrapped or bagged and held at 0F. or lower.

Yield of smoke-cooked turkeys runs about 55% of the live weight.

Data from processing 56 turkeys, ranging in dressed weight from 15.5 to 22.6-lb., showed losses of 9.5% as blood and feathers, and 11.5% as head, feet, and viscera. Necks constituted 4.0%, gizzards 2.0%, livers 1.4%, and hearts 0.04% of dressed weight. This left an average of 71.2% of live weight.

There was an average weight gain of 6.0% when curing was begun immediately after turkeys were dressed, and a gain of 3.4% when curing followed pre-chilling or freezing and thawing. Losses of about 2.0% were sustained during surface-drying of birds and before smoking.

The losses varied considerably during smoking, but averaged 17.4%. When turkeys were smoked without cooking, losses came to 14.5%.

Bacterial Count

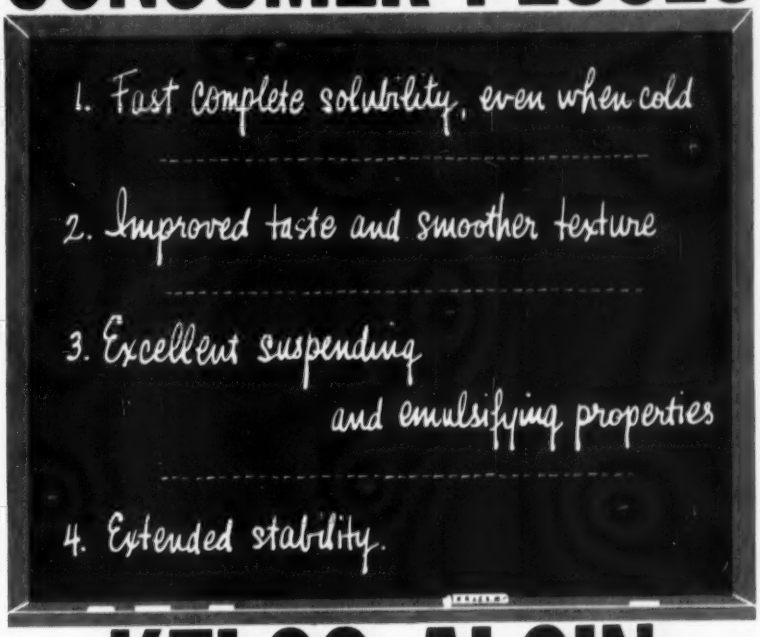
Tests showed that bacterial numbers remained practically constant throughout curing. And they did not exceed 5,000 per sq. cm.

During the first day in the smokehouse, the number of bacteria increased to about 1,000,000 but then dropped throughout smoking and storage.

Use of 20 ppm. of chlorotetracyline (antibiotic) in the cure reduced bacterial numbers in brine, but did not lower the numbers on the surface or in the cavity of the birds. Moreover, this treatment did not prolong storage life of cured-smoked turkeys. —*End*

"That the right spot, Lester?"

Now give your dry food mixes these FOUR BIG CONSUMER PLUSES


1. Fast complete solubility, even when cold
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KELCO ALGIN COLLOID

With these 4 important pluses built into your product, you create far greater consumer acceptance and demand for your dry food mixes. Manufacturers of dry food mixes such as salad dressing, icing, milk shake, pudding, gel and meringue powders have much to gain by using a Kelco algin product to secure these important consumer benefits.

YOURS ON REQUEST: Technical Bulletins describing the food applications of Kelco algin colloids.

At your service, too, are our highly qualified technicians, ready to give individual attention to solving your product and processing problems.

Write or phone your nearest Kelco office today.

KELCO
REFINED ALGIN PRODUCTS

KELCO COMPANY

120 Broadway, New York 5, N. Y.
20 N. Wacker Drive, Chicago 6, Ill.
530 W. Sixth St., Los Angeles 14, Calif.
Cable Address: Kelcoalgin, New York

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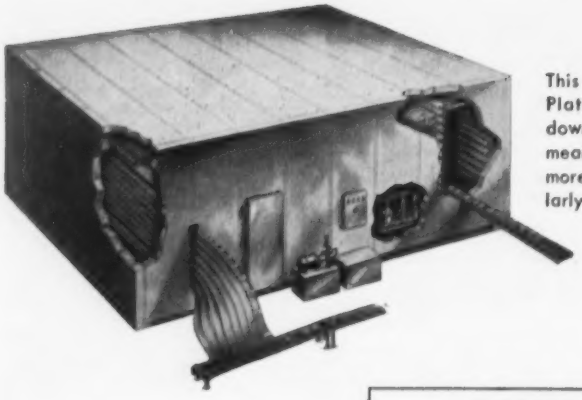
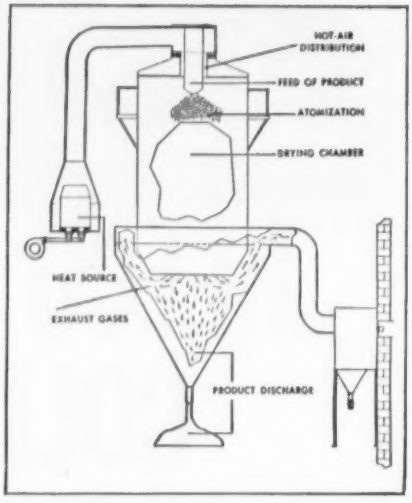
PERFORMANCE IN FOOD PROCESSING —GUARANTEED BY PROCTOR

From −55°F. to 240°F. For Liquids, for Solids.

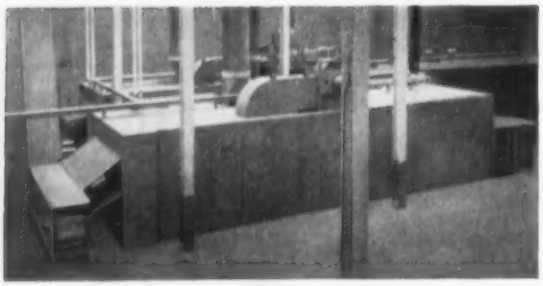
Every Proctor product for the Food and Process Industries carries the famous Proctor performance guarantee, based on wide experience and a careful analysis of product requirements. Proctor's new Continuous Plate Freezer too, is guaranteed for the same high production rates and top product quality—it too features the same reliability, the same operating economies, the same product uniformity found in all Proctor products.



This Proctor Continuous Plate Freezer operates down to −55°F.! This means quicker freezing, more production of regularly shaped packages.



Proctor Spray Dryers are designed and built to suit the requirements of your product—from pilot plant scale to large production units.



Proctor Drying Ranges are built to achieve uniform drying—the key to product quality.

PROCTOR & SCHWARTZ, INC.
PHILADELPHIA 20, PA.

Proctor

When FDA Inspects

—*Continued from page 79*

formed on the entire program and are, therefore, in a position to answer questions accurately.

5. Persons accompanying the inspector should record all remarks made by the inspector regarding any insanitary conditions.

Notes should also be made of any objectionable conditions which the inspector had an *opportunity to observe*, even though he may not have commented on them. Should a citation hearing result from the inspection, these notes would be of tremendous value.

6. If the inspector takes samples during the course of his visit, management's representatives should take duplicate samples.

7. If you use the services of a pest-control organization, keep complete written records of what the company does for you. This should include the names of insecticides, fumigants, rodenticides, or other chemicals used, and where they were applied. Such information should be made available to the inspector, if requested.

You are held equally responsible in event any pesticide—used by your pest control service—contaminates your product.

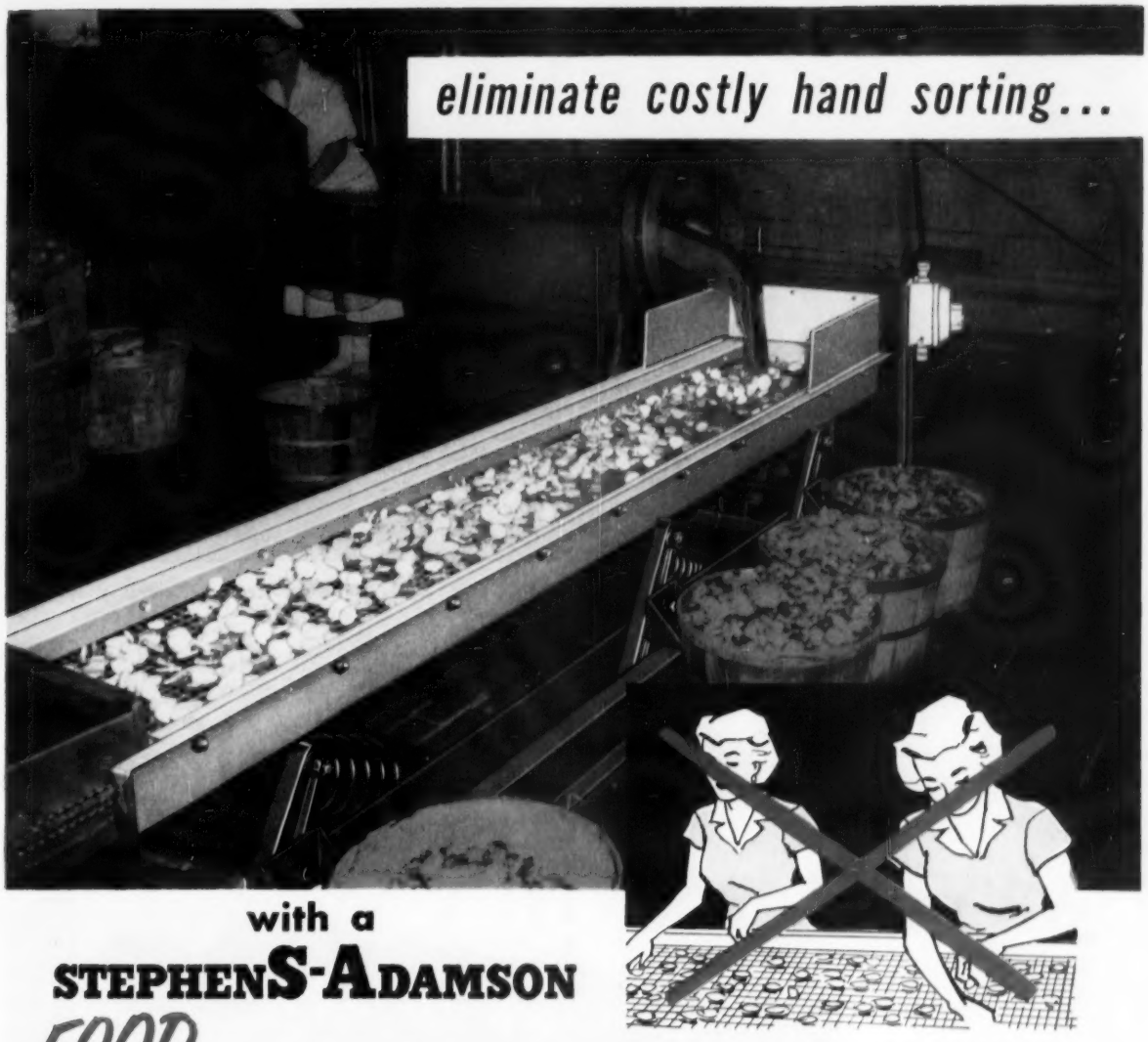
If you do all the pest-control work yourself, be sure you know what you are using and all application details.

On completion of his inspection, and before leaving the premises, the inspector is required by law to leave with you a written list of criticisms. He will set forth, in such a list, any conditions or practices which, in his opinion, show that any food in your establishment: (1) Consists in whole or in part of any filthy, putrid, or decomposed substance; or (2) has been prepared, packed, or held under insanitary conditions whereby a food may have become contaminated with filth, or whereby it may have been rendered injurious to health.

He will also give you a receipt for any samples taken. And should these be analyzed, he will furnish you a prompt report of results.

You should, of course, take immediate steps to correct any objectionable conditions or practices brought to your attention by the inspector.

If federal inspection reveals serious violations and lack of an effective sanitation program, the law requires and provides for a citation hearing. In this private and informal hearing, you are invited to show cause why you should not be prosecuted.—*End*



with a

STEPHENS-ADAMSON FOOD SLICE SEPARATING MACHINE

ADVANTAGES

- Quickly and automatically separates ends and small pieces from normal size food slices.
- Increases hourly processing capacity . . . eliminates hand sorting.
- Stainless steel screens available in standard mesh sizes from ¼" to 2" to handle almost any type of sliced material.
- Works successfully in combination with Urschel Model "O" and "OV" Transverse Food Slicers.
- Designed and ruggedly constructed to provide easy installation and efficient, trouble-free operation.

Stocked for immediate delivery.

The S-A Food Slice Separating Machine is designed to quickly and efficiently separate pickle ends and loose seeds from pickle slices, separate pits from fruit slices, and remove scraps and undersized pieces from almost any type of fruit or vegetable. The S-A Food Slice Separating Machine will handle up to 6,000 lbs. per hour on the 21-inch unit and up to 12,000 lbs. per hour on the 36-inch unit. Products are conveyed at a speed of 30 to 40 feet. The trough and all points of food contact are fabricated of stainless steel for ease of cleaning.

WRITE TODAY! . . . for complete information, request Catalog No. 657

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
LOS ANGELES, CALIFORNIA BELLEVILLE, ONTARIO
6 RIDGEWAY AVENUE, AURORA, ILLINOIS

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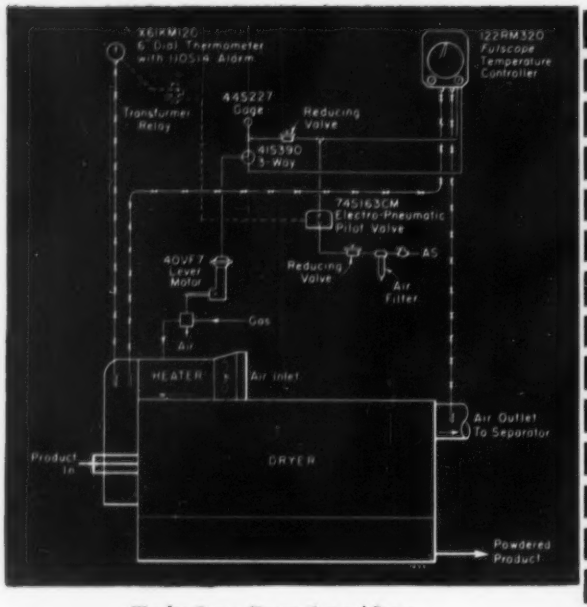
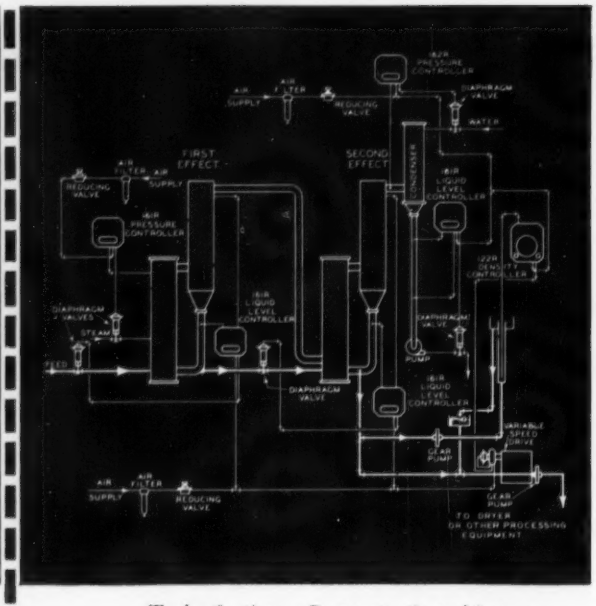


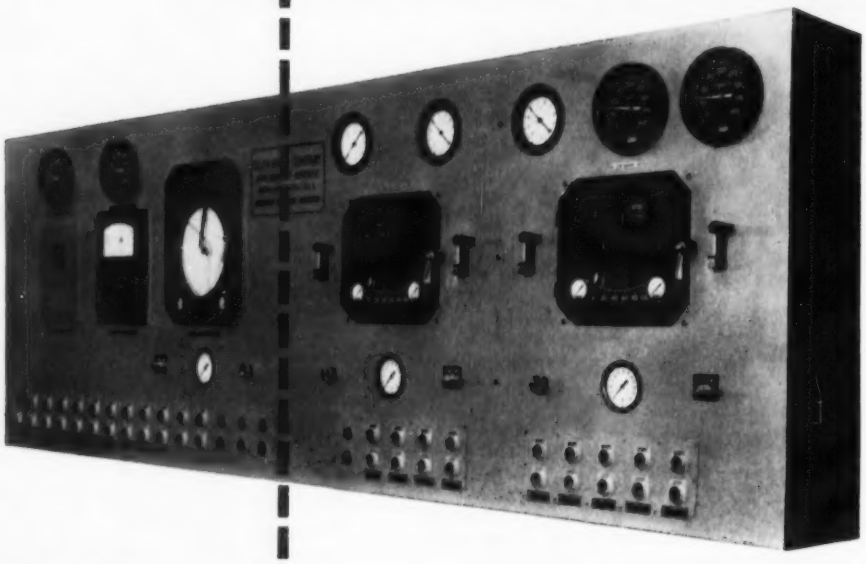
Taylor Spray Dryer Control System.



Taylor Continuous Evaporator Control System.

To insure uniform

Blaw-Knox Spray Dryer with Taylor Controls

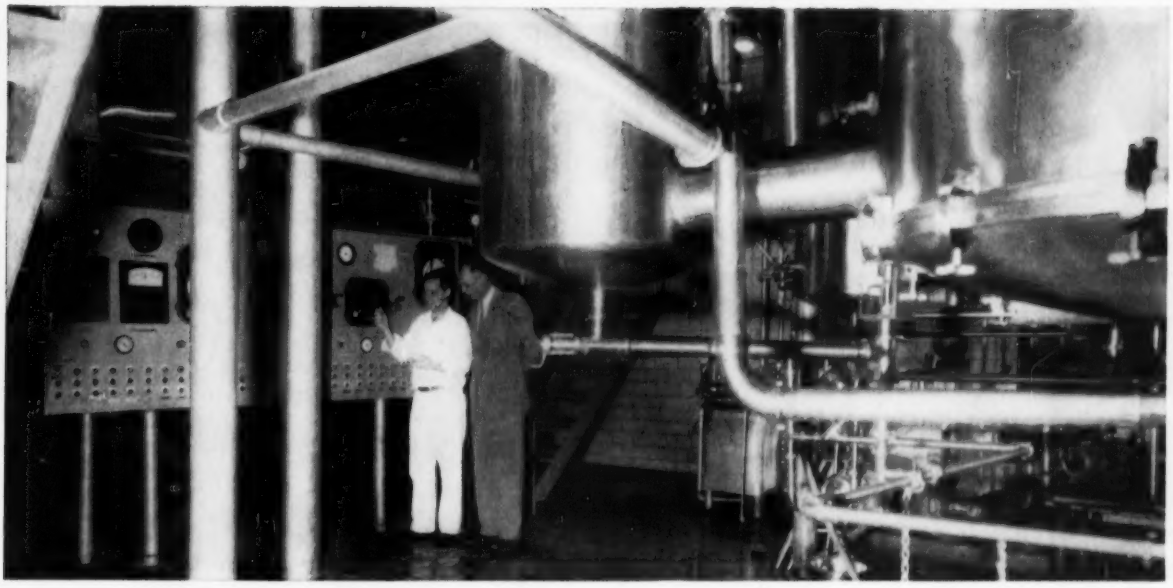


TAYLOR SPRAY DRYER CONTROL SYSTEM

Assures uniform drying by regulating the inlet temperature and coordinating the outlet temperature with the nozzle pressure for atomization.

TAYLOR CONTINUOUS EVAPORATOR CONTROL SYSTEM

Controls absolute pressure, product level, and steam pressure, to insure uniform operation and maximum efficiency.



New hi-capacity Blaw-Knox spray dryer and evaporator at Land O' Lakes First District Association in Litchfield, Minnesota.

evaporation and drying

always specify "TAYLOR EQUIPPED"

Greater product uniformity at maximum efficiency . . . that's the formula for greater profits, and that's the purpose for which the Taylor Continuous Evaporation Control System was designed. The Blaw-Knox Evaporator and Dryer shown here are both equipped with Taylor automatic control system. A coordinated system of Taylor Instruments regulates liquid level and pressure in the Continuous Evaporator to insure maximum efficiency and produce a uniform product. Taylor controls also maintain uniform moisture content of the dried product on the gas operated Spray Dryer. The dairy industry is bristling with Taylor instruments and control systems for a good reason—they have proven themselves over the years. So when you order new equipment be sure to specify—"Taylor Equipped As Usual". Taylor Instrument Companies, Rochester 1, New York, and Toronto, Canada.

▼ ▼ ▼

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

Taylor Instruments
MEAN
ACCURACY FIRST
VISION · INGENUITY · DEPENDABILITY

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SANITILE WALLS

at less than 1/15th the Cost of TILE

Enjoy the sanitary advantages of tiled walls and ceilings for only a few cents a square foot. SANITILE can be applied over cement, plaster, brick or wood by brush, spray or roller. Notice the high-gloss, glass-smooth surface that resists fungus, mold, grease, steam and repeated washings. Imagine the sparkling appearance of your processing rooms and coolers with a ceramic-like SANITILE surface, without joints or crevices to catch contamination and bacteria. Think of the savings over repeated paintings — on maintenance and sanitation costs. Write today for facts.

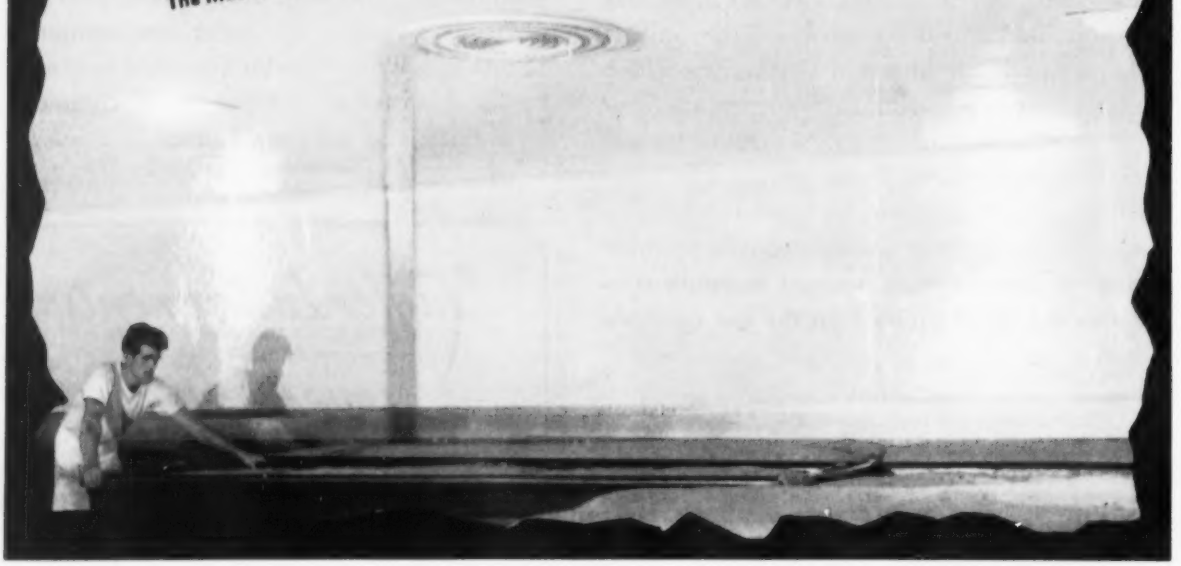
RESISTS
Steam, Condensation, water, acids, alkalies, oils & greases
RESISTS AND PREVENTS
Fungus, mold and bacteria

Serving the food industry since 1913.

EQUITABLE SERVICE SEAL

MASTER MECHANICS

The MASTER MECHANICS Co., 2097 Columbus Road, Cleveland 13, Ohio
The Master Mechanics Chemical Co. (Canada) Ltd., 88 Richmond St. W, Toronto



KEEPING UP WITH THE FIELD

Army to Feed Rayed Foods

Irradiated foods are going to be put to their biggest test.

The Army has announced plans to serve one irradiated food item every day for a month this Fall to about 300 troops at Fort Lee, Va. The items haven't been selected yet, but the Army says it will choose from among a variety of products including meats, fruits, and vegetables.

The idea of irradiating food has special appeal for the military as a potential means to overcome refrigeration problems and supply a better variety of rations to troops in the field.

FDA Ok's Film Antioxidant

Degrading effects of heat on high-pressure polyethylene film are now minimized by a new antioxidant that has just won FDA approval for use in food packaging, declares the maker, Monsanto Chemical Co., St. Louis.

The non-staining chemical compound, tradenamed Santonox, prevents oxidation of the polymer—which causes it to become rigid and brittle—at the high temperatures used in extruding and injection molding.

New Emphasis on Marketing

With food industry management shifting its attention from production to marketing, advertising agencies with grocery product accounts will face increased scrutiny of their creative and marketing services, asserts Paul S. Willis, president, Grocery Mfrs. of America.

Marketing costs are rising steadily, he observes, and intense competition precludes addition of these costs to the selling price. Therefore, the only avenue of escape is in improved sales, distribution, advertising, and promotion.

With advertising of grocery products at a record $1,000,000,000 per year, top processing management expects the agencies to provide greater assistance in the overall marketing program.

Ike Signs Poultry Inspection Bill, USDA Will Administer the Law

Compulsory USDA inspection of poultry, at government expense, goes into effect Jan. 1, 1959. However, processors may apply for it after Jan. 1, 1958.

With minor differences in House and Senate bills resolved by a joint Conference report, the measure was signed by President Eisenhower Aug. 28.

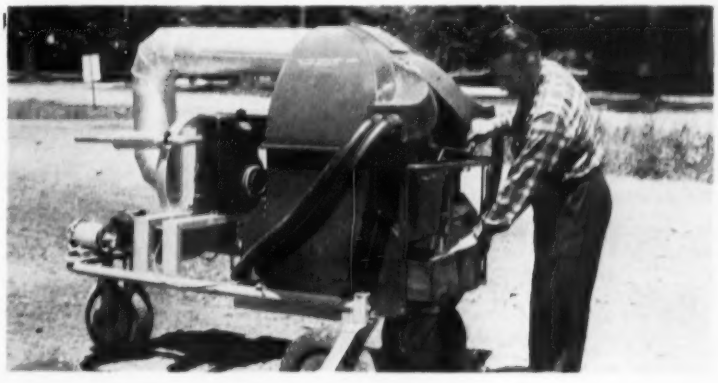
The new legislation contains major provisions sought by industry, according to C. D. Carpenter, president of the Institute of American Poultry Industries. More than 95% of this group's membership endorses the inspection as a practical means of "providing the housewife with whatever added assurance she needs to keep her consuming poultry products at a maximum rate."

Mr. Carpenter further predicts that poultry will now be in a position to compete on an equitable basis with other meats, since cost of inspection will be paid from federal funds. He added, however, that the Institute and other groups now face the responsibility of lending assistance, by way of conferences and hearings, to develop regulations that will implement the intent of the law, while maintaining economic gains already won.

The law does not apply to poultry shipped intrastate (except in certain areas that may be designated by the Secretary of Agriculture), or to live poultry, eggs and egg products, game birds, or squabs. Specific exemptions are made for producers who process their own poultry and sell direct to consumers or institutions, also for poultry processed according to religious dietary laws.

Ante-mortem inspection will be performed to the extent deemed necessary by the Secretary. Post-mortem inspection will be made of each carcass processed.

In this connection, the law stipulates that "the Secretary shall at all times provide sufficient inspectors and employ such procedures as will not slow down processing operations."



New Harvester Brightens Currant Picture

Flagging interest in cultivation and processing of currants may take a sharp reversal with the introduction of a new harvester that not only outpicks humans, but does a cleaner job of it too. The self-propelled device, now under lease by Red Wing Co., Inc., Fredonia, and Bedford Products, Inc., Dunkirk, N. Y., works on a clipper-vacuum principle. Cutting heads clip berries from the bush, and vacuum hoses suck them into a chamber, where leaves are separated and discarded. Manufacturer is El-Flo Mchy. Corp., Westfield, N. Y.

ALGIN CORPORATION OF AMERICA

ALGINATES
and
CARRAGEENATES

"The ingredients you use
BY THE PINCH
to make better products
BY THE POUND"

Marine plant extracts are no exception to the rule that the performance of a food ingredient is largely governed by its purity.

Thus, the degree of purity we have been able to impart to our super-refined alginates and carrageenates has made them dependable ingredients in a large and growing number of food products.

They are the logical choice of any food processor interested in viscosity, suspension, stabilization, or gelation. They perform these functions superbly and (as a result of their purity) with outstanding economy. For instance

1. As little as ¾ of a gram of Gelcarin® in a pint of milk forms the basis of many types of milk puddings.

2. Our Sodium Alginate is used to stabilize frostings and icings at concentrations as low as 0.1%, giving added gloss and preventing stickiness and "weeping".

Our products add no odor, no taste, and virtually no calories to the finished food product; nor do they possess any of the cloying or taste-masking properties frequently associated with many gums and starches.

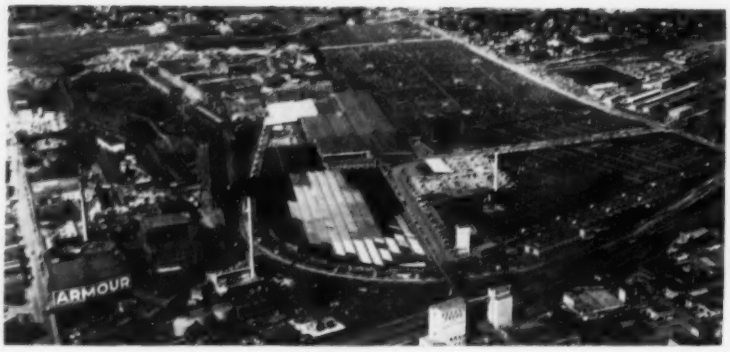
Important: their use has also led to the development of a number of new and improved forms of food products with remarkable sales records.

Write. Our technical department will be glad to answer your questions. Just tell us what you feel free to divulge about your product, your method of processing, and your problem.

MAIN OFFICE
NEW YORK 4: 24 State Street • Whitehall 4-1193

SALES OFFICES
CHICAGO 5: 600 South Michigan Ave. • WA 2-3829
LOS ANGELES 25: 2024 Westgate Ave. • BR 2-4346

Canadian Sales Representative — Charles Albert Smith Ltd.
356 Eastern Ave., Toronto 8 • 8307 Royden Road, Montreal 9



World's Biggest Stockyard Gets Bigger

Expanding its present claim as the world's largest livestock market and meat packing center, the Omaha Livestock Exchange has constructed five new packing plants during the past year. In 1956, the huge facility received 6,500,000 head of cattle, hogs, and sheep, valued at over $500,000,000.

Full Automation for Candy

Leading the trend toward automation is the new candy plant of Tuxedo Candy Co., San Jose, Calif., a subsidiary of Safeway Stores, that comes close to being the idealized "automatic factory", according to Minneapolis-Honeywell engineers.

The ultra-modern plant is literally honeycombed with automatic detection, measuring, and controlling devices that electronically monitor every operation from chocolate flow to cooking and the regulation of humidity in packaging and storing areas.

Florida Medfly Threat Ended

Federal quarantine of Florida counties affected by an invasion of the Mediterranean fruit fly has finally been lifted—thus ending the year-long fight against an insect pest that seriously threatened the State's multimillion dollar citrus and vegetable industry.

The USDA will continue to help State officials, however, in mop-up trapping and spraying operations when isolated infestations are found.

The Medfly menace (FE Jul., Aug., and Oct. '56) was finally cracked by a combination of extensive aerial and ground spraying, and soil treatment.

Bonus Dollars from Trash Fish

Billions of pounds of trash fish—netted annually, and considered a complete waste by commercial shrimp fishermen—may turn into a bonanza as a result of experiments now underway at Texas Engineering Experiment Station, College Station.

Dr. W. W. Meinke, head of the Chemurgic laboratory, is developing a process to turn the waste product into a high-quality protein supplement for poultry feed and other industrial uses.

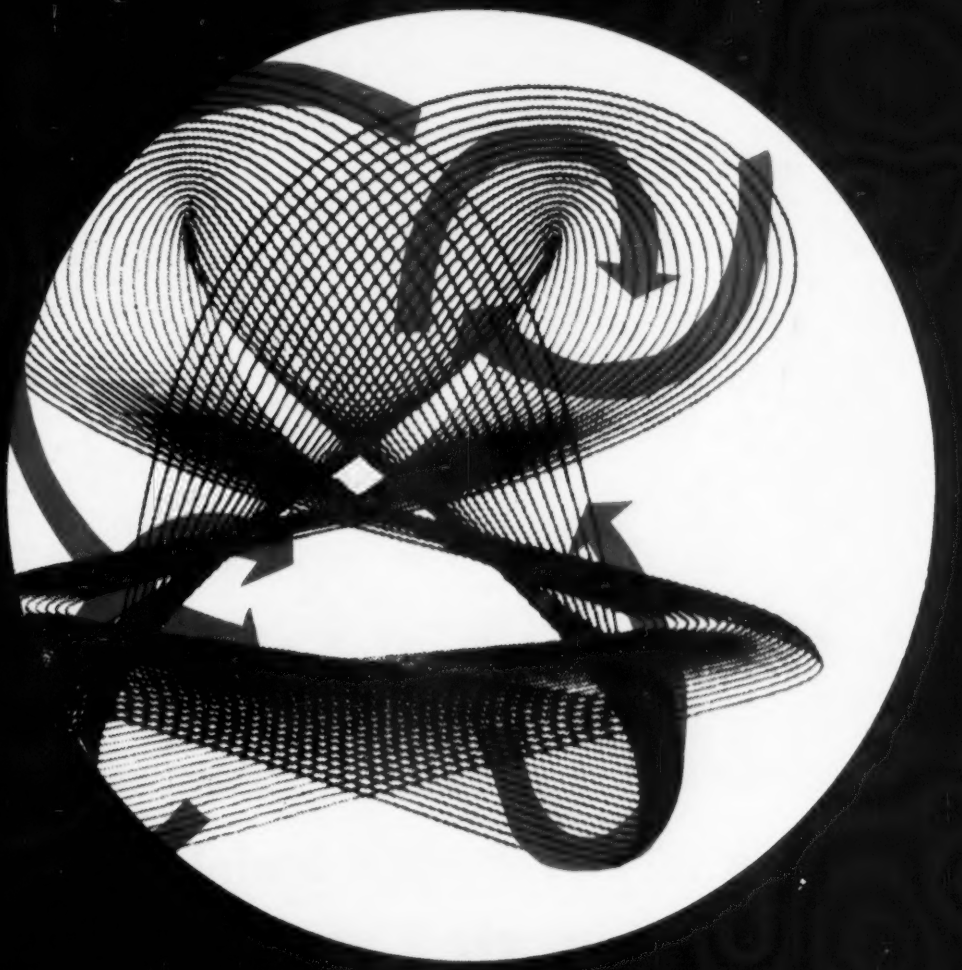
Sugarless Berries Cut Costs

Shipment of bulk frozen fruit—without the customary addition of sugar—could save a tidy sum on transportation bills for Eastern jam and preserve makers, declare food

Cont'd on p. 133

New Life for Pre-Pack Oranges

Combination of a modern plastic and a fungicide has solved the orange marketing problem for one Florida packer, Chase & Co., Windermere. In order to market its product in a polyethylene bag, the company has had to pre-treat the oranges with a fungicide, sodium orthophenylphenate made by Dow Chemical Co., which is also included in the wax. The result—better fruit at less cost from packer to housewife.



whatever the mixing job . . . a READCO mixer!

where complete dispersion is paramount . . .
where consistency, uniformity, quality count . . .
you can count on READCO mixers!

READ STANDARD
YORK, PENNSYLVANIA
a division of
CAPITOL PRODUCTS CORPORATION

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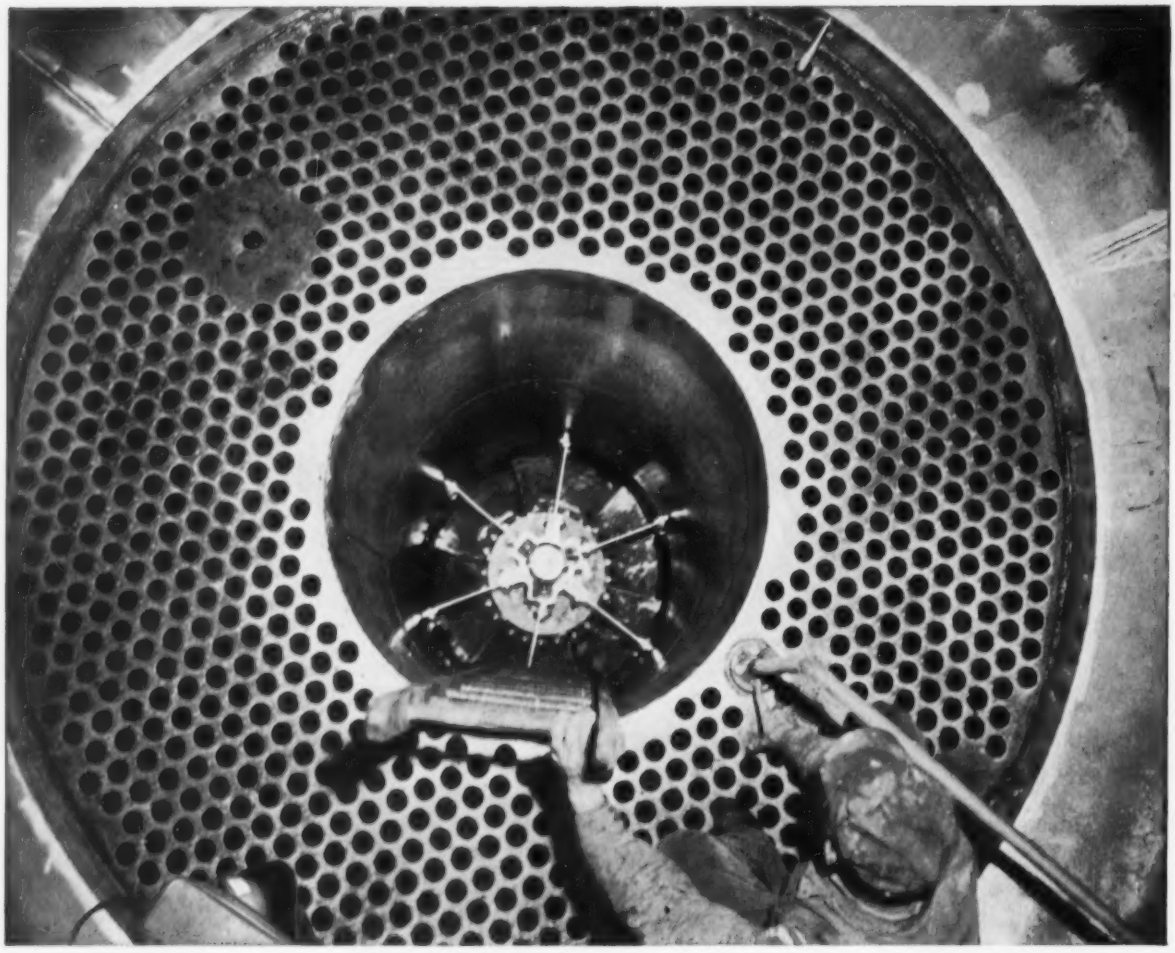


Switching to *Carpenter* Stainless Tubing pays off 5 ways!

How can *you* use the five advantages gained by a prominent distillery when it changed to Carpenter Stainless Tubing for a new stillage evaporator?

Twice the service life . . . greater operating efficiency . . . lighter weight . . . greater carrying capacity . . . and a higher cost-life ratio are the proven results obtained with more than a mile of Carpenter Stainless Tubing in this evaporator.

Additional proof of how Carpenter quality pays off on job after job is available from your Carpenter Distributor. Discover the profitable difference Carpenter can make on your own processing and transfer lines, evaporators, heat exchangers and similar applications.

Talk to your Carpenter Distributor now about cost-savings you may be able to obtain by switching to Carpenter Stainless Tubing or Pipe. Remember, you are sure of getting the highest possible degree of perfection in Carpenter tubing because it must pass the most exacting non-destructive test ever applied to stainless tubing.

MEMBER

The Carpenter Steel Company, Alloy Tube Division, Union, N.J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

Carpenter

more than corrosion resistance

Stainless Tubing & Pipe

New Spray Holds Egg Quality

Extra weeks of shelf life are added to eggs by a new spray process, devised by Safeway Stores' Brentwood Egg Co. The technique (FE Aug., p. 121) employs a stabilized oil-water emulsion, applied on the top 60% of the egg-shell surface. The spray, which is semi-permeable to carbon dioxide and water, slows down—but doesn't completely stop—natural deterioration.

technologists at Oregon State College, Corvallis.

After a series of comprehensive color, flavor, and vitamin retention tests, the researchers conclude that it is unnecessary to add the sugar to strawberries, peaches, and cherries.

Without it, Western processors could ship 55 lb. of fruit for the same cost as the present 44 lb. of fruit and 11 lb. of sugar (a 4 to 1 pack).

Additional savings are also foreseen in the elimination of the sugar mixing step.

Changes in Vinegar Use

Significant changes in consumer preference for vinegar have taken place during the past five years, according to a new marketing report, made for Owens-Illinois Glass Co., Toledo, by the Home Makers Guild of America.

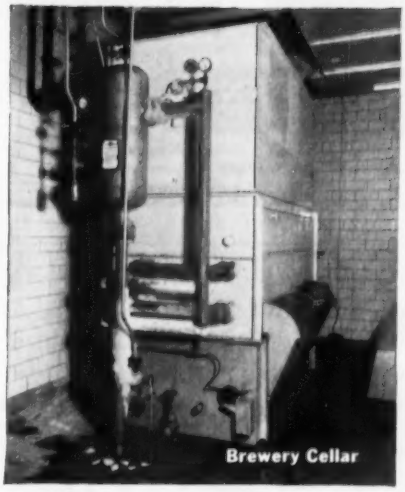
Housewives now lean toward distilled white vinegar, rather than the cider product. And homes having both on the pantry shelf have jumped from 12.6% to 21.4%.

In 1951, a pint bottle of white vinegar was the most popular size. Now, quarts have taken the lead.

NIAGARA "NO FROST"

25-Years' Successful Experience

Brewery Cellar



Brewery Cellar

★

SAVE POWER
REDUCE COSTS

★

GET FASTER
TEMPERATURE
"PULL-DOWN"

★

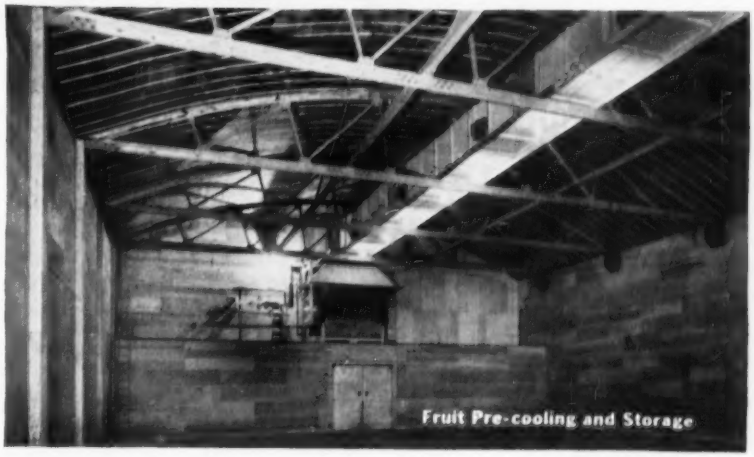
NEVER ANY
DEFROSTING
SHUTDOWNS

"No Frost" removes moisture as fast as it condenses

★

Write for Niagara Bulletin 105

★



Fruit Pre-cooling and Storage

NIAGARA BLOWER COMPANY

Dept. FI-9, 405 Lexington Ave. New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

Keep your product on the move

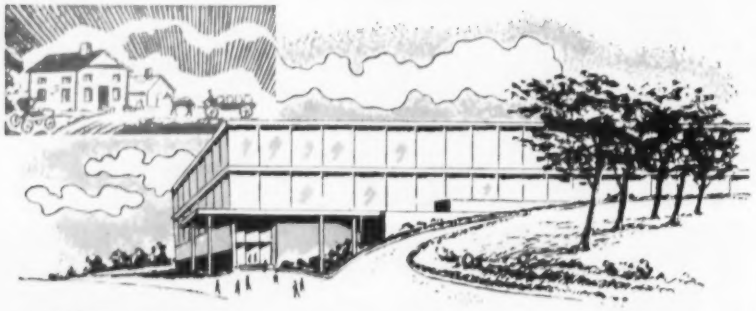
WITH ASHWORTH PROCESS BELTS

You can combine processing and product movement, whether it be doughnuts or dog biscuits, pickled beets or fried fish, potato chips or frozen rabbit, Ashworth can help make savings in production.

ASHWORTH BROS., INC.
WINCHESTER, VIRGINIA

Sales Engineers: Atlanta • Buffalo • Charlotte, N. C. • Chicago • Cleveland • Dallas • Detroit • Greenville, S. C. • Los Angeles • Louisville • New York • Philadelphia • Rochester • Seattle • St. Louis • St. Paul • Canadian Rep., PECKOVER'S LTD., Toronto • Montreal

WRITE FOR ILLUSTRATED CATALOG E 55



WILL YOUR PUMPING BE MODERN TOO?

When modernizing your plant and equipment, you can cut costs by installing positive displacement Viking Rotary Pumps. You can pump liquids ranging from milk to molasses with self-priming Vikings. You can eliminate uncertain, troublesome gadgets, extra piping, auxiliary equipment, etc.

One Viking does your pumping job from start to finish, requiring low horse power and delivering high efficiency.

Vikings have stood the test of time. Many have records of 10, 20, 30 and even 40 years with little or no maintenance. Over the years, Vikings have been improved to meet new problems and to give still better pumping service.

For the pumps that will save you money and modernize your pumping, specify Vikings. Ask for bulletin 575e today.

VIKING — the leader, not a follower, in Rotary Pumps

VIKING PUMP COMPANY
Cedar Falls, Iowa, U.S.A. In Canada, it's "ROTO-KING" pumps

See our Catalog in Sweets Plant Engineers File

And in the cider variety, pints and gallons have yielded to quarts and half-gallon bottles.

Also, there has been a substantial increase, according to the Guild, in homes stocking wine and tarragon vinegars.

BRIEFLY

• **SUGAR** companies must put more emphasis on basic research, declare Dr. L. D. Baver, director of the Hawaiian Sugar Planters' Assn. Experiment Station, and Dr. J. H. Payne, sugar technologist. The two researchers, after completing an around the world trip, assert that both European and Australian scientists are ahead of Hawaii in this regard.

• **METAL CAN** production hit 15.5 billion units in the first five months of '57, a slight gain over '56, announces American Can Co. Food products contributing are seafoods (21.5% rise), soft drinks (11.5%), and beer (9.2%).

• **OREGON STATE COLLEGE** has merged administration of dairy, animal husbandry, and food technology courses in the interest of efficiency.

• **PUBLIC HEALTH** training has received awards and grants totalling almost $2,000,000, according to the Public Health Service.

• **COFFEE ROASTERS** may soon be able to tell just how long to roast the savory beans with a new vapor phase fractometer—or "sniffing machine"—now under development at Southwest Research Institute, San Antonio, Tex.

New Cheese Powder

Powdered cheese—that will store almost indefinitely—is the result of a new process, developed by N. V. Vika, Soest, Netherlands.

The product, having a moisture content less than 5%, is made from Gouda and Edam cheeses and is intended for both home and commercial use. It does not saponify, become strong or rancid. And it won't mold.

To Set Instrument Terms

Necessity for a common language in describing automatic control instruments has led to formation of a "Terminology Committee" by the American Standards Assn.

Aim of the group, which is headed up by M. A. Princi, General Electric Co., is to establish a dictionary

A technical report from Du Pont

Check these advantages of ALATHON®

POLYETHYLENE RESINS

- √ superior stiffness
- √ superior impermeability
- √ superior tear strength
- √ superior toughness

There is a complete family of ALATHON polyethylene resins, each designed to meet a range of packaging needs. Whether you package in film, molded containers or laminated cartons, you will find a Du Pont ALATHON with properties best suited to your particular needs.

The property differences of ALATHON polyethylene resins are based on three basic factors in their composition: Melt Index, Density and Molecular Weight Distribution.

Melt Index is a measure of fluidity of the molten plastic under specific conditions. High melt index means that the molten plastic flows readily, whereas low melt index means it is stiffer in the melt.

Density, or specific gravity, is a convenient measure of the extent to which the resin has crystallized. A higher degree of crystallinity means increased stiffness, higher yield point, greater resistance to cold flow or "creep." A lower degree of crystallinity means greater flexibility, resistance to flex fatigue and resistance to impact.

Molecular Weight Distribution refers to the uniformity of sizes of the polyethylene molecules. A polyethylene with a narrow distribution of molecular sizes exhibits improved film toughness, extreme low temperature toughness, and resistance to environmental stress cracking.

Now, by controlling these factors . . . Melt Index, Density and Molecular Weight Distribution . . . polyethylene can be made with properties specially suited to individual packaging applications.

For example, if stiffness is required, a resin of high density should be used, since as the density is increased, the stiffness increases. ALATHON 31, 34 and 37 have been formulated for outstanding stiffness. They have a density of 0.930 grams per cubic centimeter at 23°C., which represents one of the highest densities available in conventional polyethylenes.

Permeability, also, is determined by the density of the material. When the polyethylene molecules are densely packed, the resin will have greater impermeability to moisture, gases and oils than a resin of lower density. To meet these requirements, Du Pont has developed ALATHON 34. It has proven exceptionally well suited for use in coating paper because of its outstanding grease-resistance.

Several factors influence the tear strength of polyethylenes. Tear strength may be improved by using a resin with high density, or a resin with a low melt index. ALATHON 34 and 14 respectively impart these characteristics.

To make a polyethylene film which has good impact toughness, a resin with a low density, low melt index and narrow molecular weight distribution would be best. Film made from ALATHON 14 or 22 has the right combination to give tougher, more durable packaging for such heavy items as apples and potatoes.

For more information on ALATHON . . . how a specific ALATHON can make a better package for your product, simply clip and mail the coupon below.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department,
Room 269, Du Pont Building, Wilmington 98, Delaware.

Please send me complete information on Du Pont ALATHON polyethylene resins.
I am interested in evaluating these materials for_____

*Name*_____ *Position*_____

*Firm Name*_____

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In Canada: Du Pont Company of Canada (1956) Limited, P. O. Box 660, Montreal, Quebec

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for the butcher,

the baker,

the candy-stick maker...

Oakite announces a new, superior detergent

Super-Det

Here is a new detergent in a class all by itself. Oakite Super-Det has every quality of the finest detergent—only more so!

For instance, if you want fast wetting-out action, Oakite Super-Det stands out a mile ahead of ordinary detergents. Or is it all-round cleaning ability you want? Oakite Super-Det is a star performer on *dozens* of different types of food soils. How about free-rinsing properties... low concentration required ...water-softening action...safety to metals, rubber, glass—and hands? Ordinary detergents might feature a single one of these desirable qualities. Oakite Super-Det features *all* of them.

Where superior sanitation is required, as in food plants, Oakite Super-Det is ideal. It's designed for packers, canners, breweries, frozen food processors, meat packers, bakeries, dairies.

Ask your local Oakite Technical Service Representative to demonstrate Super-Det in your own plant under your own conditions. Or write for details to Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE

Export Division Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

of terms and definitions for process controls, feedback systems, regulating controls, and other automatic devices.

Action on Standards

Following actions have been taken by the Agricultural Marketing Service (AMS) and Food & Drug Administration (FDA) on U. S. Standards and allowable tolerances of various pesticides on raw agricultural commodities. References are to the *Federal Register*.

Kadota figs, canned, AMS notice of U. S. Standards, *F.R.*, Jul. 16, p. 5555.

Celery, AMS notice of U. S. Standards, *F.R.*, Jul. 17, p. 5623.

Cranberries, fresh, AMS notice of U. S. Standards, *F.R.*, Jul. 24, p. 5853.

Raisins, AMS notice of proposed amended U. S. Standards, *F.R.*, Jul. 27, p. 5958.

Grape juice, frozen concentrated sweetened, AMS notice of U. S. Standards, *F.R.*, Aug. 2, p. 6077.

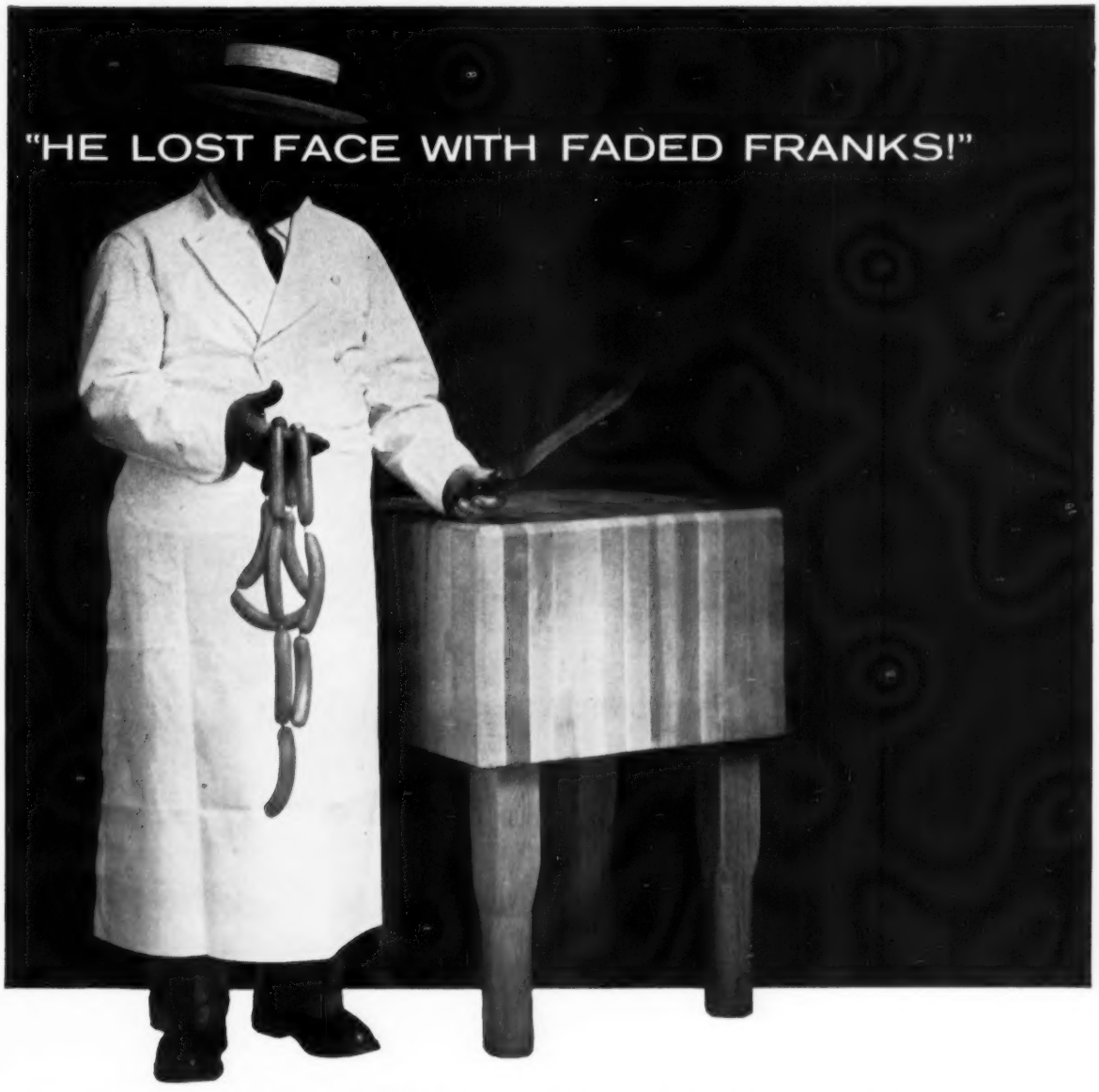
Avocados, Florida, AMS notice of U. S. Standards, *F.R.*, Aug. 3, p. 6205.

Sweet cherries, frozen, AMS notice of proposed revised U. S. Standards, *F.R.*, Aug. 9, p. 6383.

Lemonade, frozen concentrates, notice of extension of time for filing

New Label for Meats

Burnt holes in film wrappers for prepackaged meats can be eliminated by labeling the products with a new low temperature adhesive label paper, according to the maker, Nashua Corp., Nashua, N. H. Secret of the new label is the adhesive, which has a wide sealing range (215-345F.) This reduces the chance of burning the films, a danger that increases at temperatures over 350F.



protect color–protect sales with low cost

PFIZER ISOASCORBIC ACID

(or Sodium Isoascorbate)

Quality is not enough in your products! The processed meats your retail customers put in their display cases must also have *eye-appeal.*

You can have new confidence in the eye-appeal of your processed meats, if you add Pfizer Isoascorbic Acid or Sodium Isoascorbate during the chop. The color of your franks, bologna and other products will not only be better to start with, but will also last longer on the shelf.

In addition, you will find when you use Pfizer Isoascorbic Acid or Sodium Isoascorbate that your meat products need less smokehouse time to develop full-bodied color. You save fuel, speed production and reduce shrinkage.

These "iso" forms of ascorbic acid cost you less than ascorbic acid U.S.P. and are *fully as effective* for improving color. Why not give your meat products this important sales protection? Write for a free wall chart which explains use of Pfizer Isoascorbic Acid and Sodium Isoascorbate. Ask also for a free sample of whichever product you would like to test.

Quality ingredients for the food industry for over a century

Pfizer

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Thousands of types of *process equipment* . . . hundreds of different *materials of construction* . . . *engineering services* by the score . . . this vast wealth of data is placed right at your fingertips in the 2000 pages of CEC. Here you will find nothing but the facts about products and services from over 500 companies. Indexed 6-ways, CEC quickly reveals sources of supply, product functions, trade names, specialized services . . . and leads you directly to detailed product catalogs. It is published exclusively to serve your processing needs and for over 40 years has been an unfailing source of information. More than ever, it's bound to serve *you* best today.

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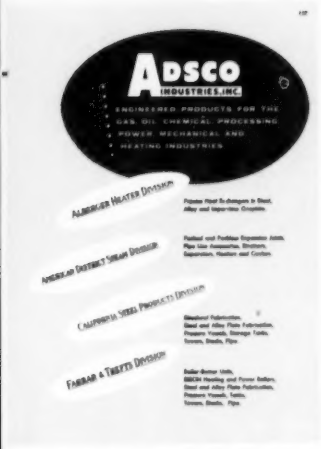
From abietic acid to zirconium tetrafluoride, CMC is the only reference source in the process industries that answers your questions about the thousands of chemicals and raw materials available today. You will find it indexed 5-ways to lead you to the answers fast . . . producers, products, functions, applications, trade names . . . all supported by hundreds and hundreds of pages of product data in catalog form. CMC is the exclusive reference of the process industries . . . up-to-date, authoritative, detailed. It's bound to serve *you* best.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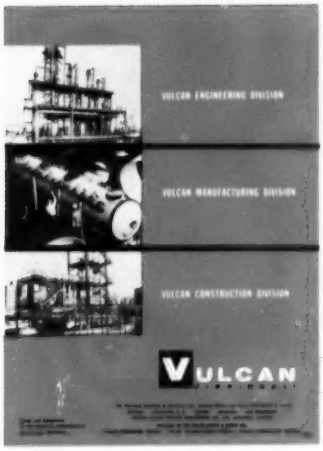
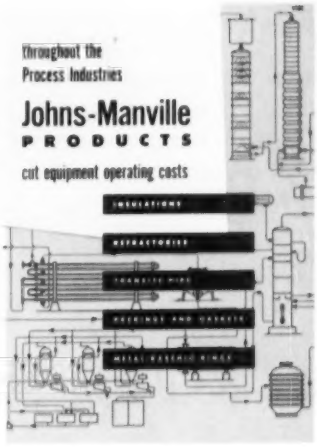
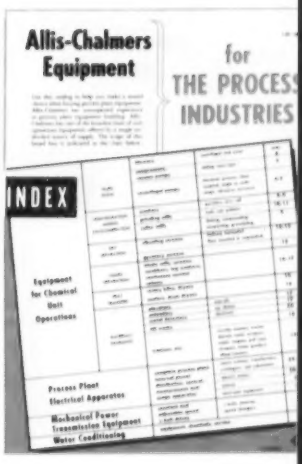
INDUSTRIES, INC.
ENGINEERED PRODUCTS FOR THE GAS, OIL, CHEMICAL PROCESSING, POWER, MECHANICAL AND HEATING INDUSTRIES







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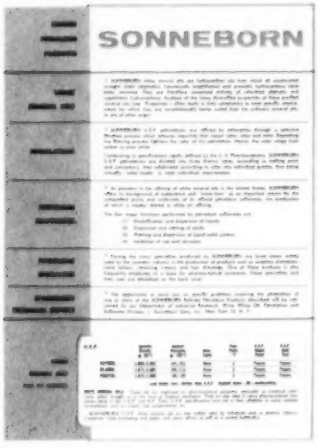
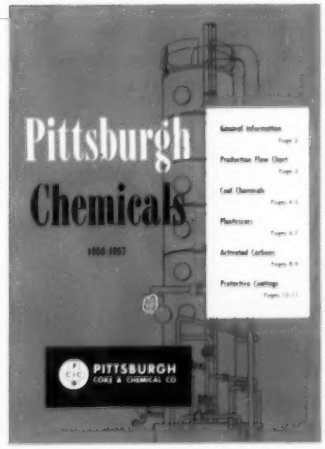


(Typical of the many detailed product catalogs in CMC)

56-57

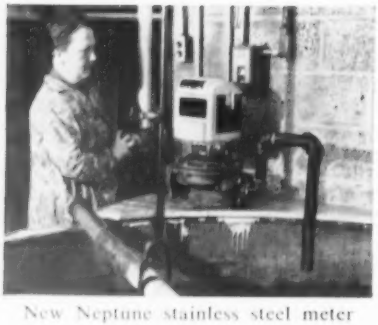


REINHOLD
PUBLISHING
CORPORATION

430 Park Avenue, New York 22, N. Y.

NEW
NEPTUNE STAINLESS STEEL LIQUID METER

ONLY TWO MOVING PARTS IN THE LIQUID



New Neptune stainless steel meter accurately measures sulfuric acid at Parwel Mfg. Co., Gloversville, N. Y.

Now you can achieve fine-instrument accuracy in the processing of corrosive liquids . . . in batching, blending, transfer, cost accounting, etc. . . . with this new Neptune Stainless Steel Meter.

Also important in processing applications, this Neptune meter ends many problems caused by contamination of liquids measured.

Based on the reliable Neptune positive displacement principal, its accuracy is completely protected from the effects of corrosion or corrosive wear. There are only two moving elements in contact with the liquid. The gear-train is mounted outside the casing, isolated from the liquid.

Available with Direct Reading, Print-O-Meter or Auto-Switch Registers. Size 1½", capacity 100 gpm. with most liquids.

Ask for Bulletin 94/10 NF

neptune

NEPTUNE METER COMPANY · 19 West 50th St., New York 20, N.Y.

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IN CANADA: NEPTUNE METERS LTD., 1430 LAKESHORE RD., TORONTO 14, ONT.

views & comments, on FDA Standards of Identity, *F.R.*, Aug. 8, p. 6349.

On asparagus, apples, and pears, tolerances of sodium 2,2-dichloropropionate, *F.R.*, Aug. 6, p. 6279.

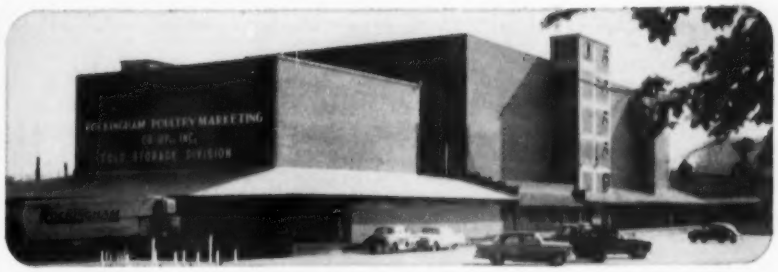
Schedule of Events

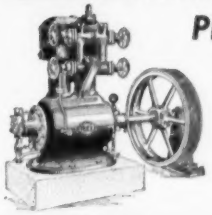
September

17-19—Dairy Products Institute, annual meeting; U. of Minnesota, St. Paul.
20-24—American Meat Institute, annual convention; Palmer House, Chicago.
30-O2—American Oil Chemist's Society, annual fall meeting; Netherland Hilton Hotel, Cincinnati.

October

1- 3—Joint Military-Industry Packaging & Materials Handling Symposium; Fort Lee, Va.
3- 4—Quartermaster Assn., annual convention; Fairmont Hotel, San Francisco.
4—Symposium on Food Processing & Agriculture; N. Y. State Agricultural Experiment Station, Geneva.
8-10—International Assn. of Milk & Food Sanitarians, annual meeting; Brown Hotel, Louisville, Ky.
10-11—American Butter Institute, annual meeting; Congress Hotel, Chicago.
11-12—National Soft Wheat Millers Assn., annual meeting; Washington-Duke Hotel, Durham, N. C.
11-13—National Poultry, Butter & Egg Assn., annual convention & trade show; Hotel Sherman, Chicago.
13-15—Brewers' Assn. of America, annual convention & exhibit; Edgewater Beach Hotel, Chicago.
14-17—American Institute of Baking, annual meeting; Morrison Hotel, Chicago.
14-16—Sanitation Maintenance Show & Conference; Navy Pier, Chicago.
14-17—National Assn. of Bakery Sanitarians, annual meeting; Hotel Morrison, Chicago.
16-19—National Bakery Suppliers Assn., annual convention; Edgewater Beach Hotel, Chicago.
17—Peanut Butter Sandwich & Cookie Mfrs. Assn., annual meeting; Sheraton Hotel, Philadelphia.
19-23—American Bakers Assn., annual meeting; Sherman Hotel, Chicago.
20-25—International Assn. of Ice Cream Mfrs., Dairy Industries Supply Assn., and Milk Industry Foundation; joint annual convention; Fairmont, Mark Hopkins, and Sheraton-Palace Hotels, San Francisco.
21-25—National Safety Congress & Exposition; Conrad Hilton, Congress, La Salle, Morrison, and Hamilton Hotels, Chicago.
22-25—American Dietetic Assn., annual meeting & exhibit; Dinner Key Auditorium, Miami, Fla.
22—National Assn. of Wholesale Pie Bakers, annual meeting; Hotel Sherman, Chicago.
24-26—National Pretzel Bakers Institute, annual meeting; Sheraton Belvedere Hotel, Baltimore.
28-30—Packaging Institute, annual forum; Statler Hotel, New York City.
28-31—Society of Industrial Packaging & Materials Handling Engineers, national exposition; Convention Hall, Atlantic City.





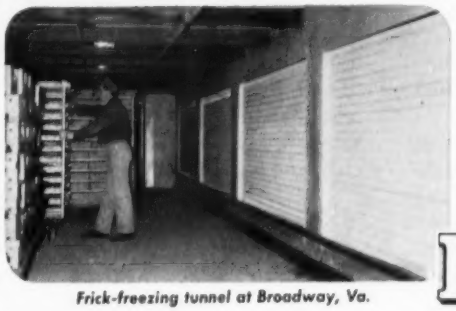
Thirteen Frick compressors serve the Rockingham Co-op.

Processing 36,000 Chickens A Day—

The Rockingham Poultry Marketing Co-op., Inc., has six buildings in its great plant near Broadway, Va.

Frick refrigeration has aided the growth of the plant for 20 years in a wide variety of ways—cooling numerous storages to different temperatures, quick-freezing poultry and other products, making 50 tons of ice daily, and doing air conditioning.

What is YOUR special cooling problem? Let Frick Engineers aid you in solving it now. Write, wire or phone



Frick-freezing tunnel at Broadway, Va.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U.S.A.

Just out . . . actual case histories of production line savings

We've compiled 35 different case histories from our files proving that many manufacturers can effect really worthwhile savings with USS Cyclone Processing Belts. The whole story is in a new booklet that's yours for the asking. You'll see how producers have cut costs, increased production, saved space and time and lowered labor costs . . . all with Cyclone Belts. These examples explain the use of Cyclone Processing Belts in stainless and carbon steels, in various shapes, designs and sizes . . . all of them saving money for their users. Just fill in the handy coupon. We're sure it will be well worth your while.

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UNITED STATES STEEL

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New, exclusive cab-forward design

One of 9 reasons why fleets find International Trucks cost least to own!

Compact, new cab-forward INTERNATIONAL Trucks feature *low*, full-size cabs for convenient access to save drivers time and effort . . . short turning radius with bumper clearance for easier maneuvering even in tightest quarters.

These new INTERNATIONALS really *move* on the highway with more powerful engines in every model. They haul bigger legal loads with improved weight distribution, with less length.

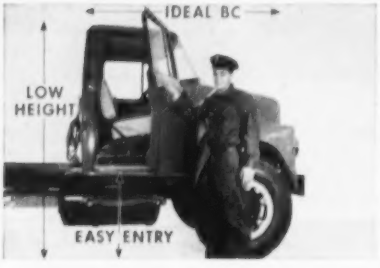
As you would expect, new cab-forward INTERNATIONALS are quality-built from the rugged bumpers to the end of the sturdy frames . . . built to do a truck job better, longer, for less.

And INTERNATIONAL Trucks cost *least* to own—cost records prove* this. Let your INTERNATIONAL Dealer show you today.

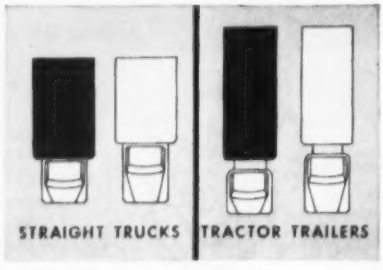
**Signed statements in our files, from fleet operators throughout the U.S., back up this statement.*

INTERNATIONAL HARVESTER COMPANY, CHICAGO

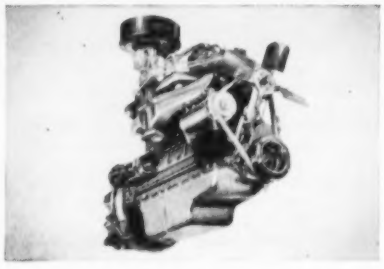
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



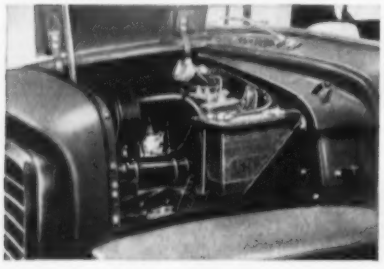
1 Longer legal payloads with ideal 89-inch bumper-to-back-of-cab dimension. Full size, unobstructed cab has 61-inch full-width seats, no wheelhousings. Only 3¼ inches higher than conventional models. Easier, more convenient entry and exit.



2 Bigger payloads with better weight distribution. More load space than conventional trucks with same over-all length—or the same load space with shorter over-all length. Easier to drive and maneuver. Safer, too, with better all-around vision.

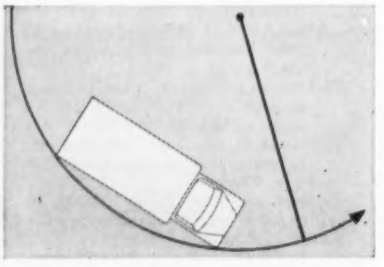


3 Lively, low cost performance with INTERNATIONAL-built engines that produce more *usable* horsepower at low rpm. Higher compression ratios for greater efficiency and economy. 12-volt ignition with "hot spark" circuit. Engines for every job.



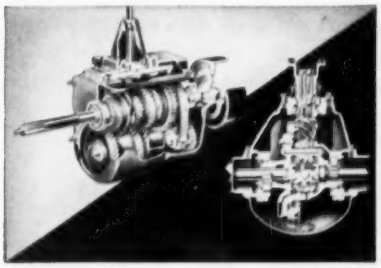
4 Superior engine accessibility saves time and money. Large side opening hood permits complete freedom to all engine compartment components. Master cylinder, battery and most frequently serviced units are conveniently located.

5 Low first cost. New INTERNATIONAL cab-forward models are priced right down with the lowest. They are quality-built throughout to keep operating and upkeep expense at rock bottom. Result: they are built to cost *least* to own over the years.

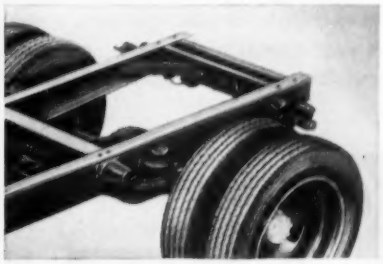


6 Minimum front overhang and true geometric steering for short turning radius with bumper clearance. Cam and roller-mounted twin lever gears are mounted ahead of the front axle. Comfortably positioned four-spoke, safety steering wheel.

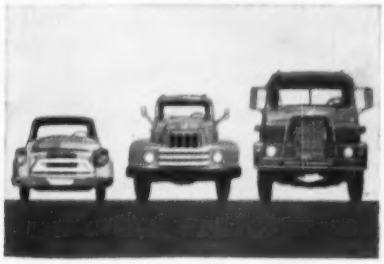
This is the new INTERNATIONAL cab-forward design . . . Golden Anniversary models with short 89-inch bumper-to-back-of-cab dimension . . . trucks that are low in height, low in price. All have more powerful six-cylinder engines. Four-and six-wheel models from 9,000 to 33,000 lbs. GVW are available with the widest selection of components and equipment to match every hauling job requirement exactly . . . built to cost *least* to own over the years.



7 Choice of transmissions and rear axles assures you the proper capacity and final drive ratios to match the engine power, your load and road conditions *exactly*. You save on fuel. You get superior on-the-job performance and extended truck life.



8 Steel-Flex frames combine great strength without excess weight. Non-crystallizing cold squeezed rivets are used throughout for extra rigidity and proper flexibility. Factory-built drop-frame models are available to reduce loading time and effort.



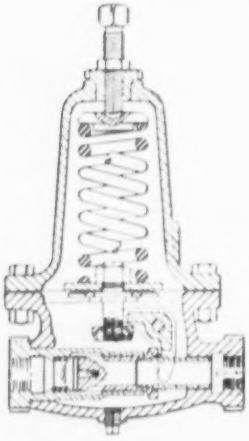
9 World's most complete line. There is an INTERNATIONAL "tailor-made" for every job, half-tonners to 96,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own.

For more data, circle this page number on card at back →

For better molded products...

CASH STANDARD type 1000 VALVES

keep mold temperatures in the "Safety Zone"



In the production of molded parts, uniform quality is assured through careful control of time, temperature, pressure and other factors in the molding cycle.

A leading producer of precision molded plastics parts is General Electric Company's Plastics Department, Decatur, Ill. On G-E's compression molding machines, almost 200 Cash Standard Type 1000 Reducing Valves are in use, keeping mold temperatures constant by controlling the steam supply.

Donald F. Thompson, G-E's Supervisor of Plant and Facilities Engineering, says: "For our particular application, where we use a large number of reducers, it is essential that the initial cost and maintenance cost be held to a minimum. We have found that Cash Standard 1000's have done the job very effectively."

The unique construction of this valve provides high capacity and accurate control of steam, water, air, oil and most gases and chemicals. Exclusive streamlined inner valve eliminates turbulence; flow through valve housing is in a straight uninterrupted line; an aspirating effect controls valve opening by amplifying slight pressure changes into large valve operating forces.

What's *your* control problem? Contact the Cash Standard control specialist in your area for more information on this unusual valve and other Cash Standard control products, or write Dept. G.

CASH CS **STANDARD**

A. W. Cash Co. and Its Subsidiary, Cash Standard Stacon Corp.
P. O. Box 551, Decatur, Ill.

Pressure, Hydraulic, Temperature, Process and Combustion Controls

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MEN & COMPANIES—

Personnel

Wayne Body, v.-p. of Wm. Wrigley Jr., Co., Ltd., has been elected president of Confectionery, Chocolate & Cocoa Industries of Canada.

Joseph L. Fortescue has been appointed manager of Ungerer & Co.'s Philadelphia office.

K. C. Hardwicke is new v.-p. of Libby, McNeill & Libby, in charge of salmon operations. Concurrent with his promotion is that of **Dr. R. M. Schaffner** to v.-p. in charge of research and QC.

D. M. Henry is now production v.-p. of Kellogg Co. of Canada, Ltd.

Lloyd T. Jensen is now v.-p. and general superintendent of Great Western Sugar Co., with headquarters at Denver. He succeeds retiring **H. L. Hartburg.**

A. Z. Kouri, former v.-p. and general manager of General Mills' Grocery Products Div., has been named co-administrator of consumer food activities.

A. C. Mathewson is now president of Gold'N Rich Corp., Berkeley, Calif., a newly organized milk processing firm.

George F. O'Connell has been promoted to post of director of purchases for 118 member bakeries of Quality Bakers of America Cooperative.

Basil Ryals is now general manager of Northwest Poultry & Dairy Products Co., Portland, Ore. He succeeds **C. W. Norton**, who died June 17.

Louis S. Sisto is now a v.-p. of United Fruit Co. He had been comptroller.

Edgar A. Thurman, president of Green Hill, Inc., Elliston, Va., is newly elected president of the Virginia Meat Packers Assn.

Just named general manager of the Florida Citrus Commission, Homer E. Hooks made this declaration:

Homer E. Hooks
—Steers Florida Citrus Commission

"It is my intention to coordinate the abilities of the Commission's fine staff and merchandising force to do a dynamic service for every phase of the Florida citrus industry."

For the past year, Mr. Hooks has been general manager of H. P. Hood & Sons' citrus concentrate plant at Dunedin.

Prior to going with Hood, he was assistant general manager of Florida Citrus Canners Cooperative at Lake Wales. And earlier he was v.-p. in charge of sales of Lakeland Highlands Canning Co., Highlands City; secretary-manager of the Canners League of Florida, with headquarters in Lakeland; and citrus staff writer for one of the major Florida newspapers.

He served in the U. S. Infantry in World War II and in Army Intelligence during the Korean War. He is a graduate of the University of Florida, where he was named to Phi Beta Kappa.

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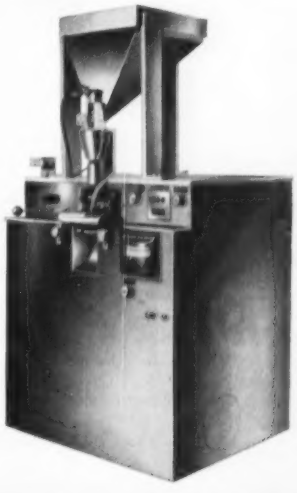

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FE-9

Park C. Lockwood is now a v.-p. and member of board of F. M. Stamper Co., Banquet Canning Co.'s parent organization. He formerly was sales manager of Banquet.

Lloyd E. Skinner, who heads Skinner Mfg. Co., Omaha, has been re-elected president of the National Macaroni Manufacturers' Assn. "Consumption figures," he states, "indicate that macaroni products have now become summer favorites." Other officers elected include **H. P. Gioia, E. Rorzoni Jr.**, and **A. Ravarina.**

Gilbert Van Camp, Jr., has been named president of Van Camp Sea Food Co., San Diego. He succeeds his father, **Gilbert C. Van Camp, Sr.**, who becomes chairman of board.

Joseph J. Zarrella, Jr. is now president of Holiday Coffee Corp.

Industry

Anheuser-Busch, Inc., plans to build a brewery in Tampa, Fla.

California Packing Corp. is now marketing 19 pickle items (Del Monte) in the Midwest, a canning line having been added at its Rochelle, Ill., plant. Until now, Calpak pickle production was limited to the San Jose, Calif., plant.

D. L. Clark Co.'s Evanston, Ill., candy plant has received the American Sanitation Institute's Award of Excellence.

Cocoline Chocolate Co., Inc. —formerly Cocoline Products, Inc.—has just completed a $1-million expansion program. Projects included three new buildings in Brooklyn, with modern equipment to treble output.

Davis Packing Co. has formally opened in Chicago's Union Stock Yards. James Irwin Davis, founder of new firm, was general manager of Great Western Beef Co.

Dromedary Co., Div. of National Biscuit Co. has shut down its 200-employee plant in Richmond, Calif., and shifted the production to a

Allis Chalmers' new $3¼ million engineering and research lab is now going up on Harvey, Ill., plot seen here being surveyed by **Owen J. Higgins** (left), general manager, Harvey works; **C. L. Thompson**, materials handling sales manager; and **F. C. Schuster**, materials handling chief engineer. Latter rides one of company's FT-100 lift trucks. Occasion was recent ground-breaking ceremony.

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NEW flexible batten door

All-neoprene batten door designed for use with power trucks

*Jamison Trademark

Flexidor is light and resilient to absorb and dissipate the shock of impact; reinforced door noses add strength, prevent buckling or wrap around on impact. Free-swinging door suspension provides minimum impact resistance. Jamison two-way gravity cam hinges assure fast closing.

Flexidor is available in a full range of sizes for use in new construction or to replace rigid battens. Complete information is available from the Jamison Cold Storage Door Co., Hagerstown, Md.

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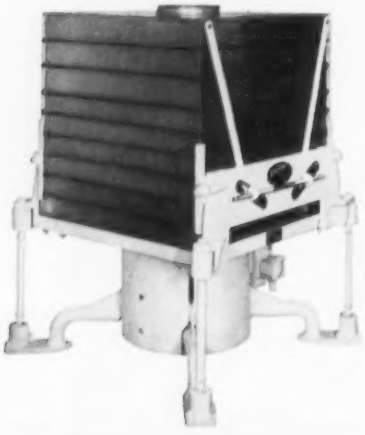

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GYRO-WHIP SIFTERS

They're amazingly compact, yet sift in huge volumes – real space savers. Simplified design cuts maintenance and cleaning time and makes possible the utmost sanitation. Available in many sizes. Stainless steel and wood construction. Write for Bulletin 135-A!

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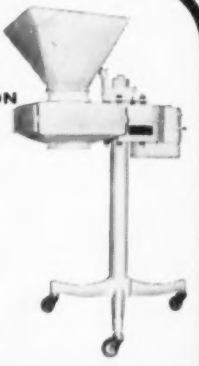

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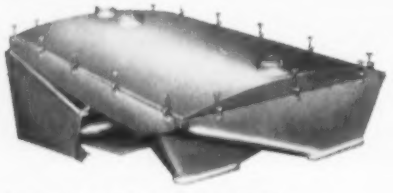

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Splits one stream into two to eight equal divisions. Handles all types of free-flowing materials. Requires little space. Easy to install. Has many money-saving applications. Get full details. Write for Bulletin 137!

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PR/804-F

Samuel Levine is newly appointed general sales and advertising manager of Vita Food Products, Inc., New York City. A 10-yr. member of the organization, he's now spearheading a program to broaden the company's product distribution.

Leon Mandeville has taken the newly created post of assistant to the president of Canada Dry Ginger Ale, Inc. Most recently he was in charge of the firm's Southeastern Division, and earlier was operations manager handling the company's Atlanta activities.

newly expanded Dromedary plant at Lyons, N. Y.

Heeny Frosted Foods Ltd., Ottawa and Laprarie, Que., has started construction of a new $700,000 food freezing and processing plant at Sherwood, Prince Edward Island. Plant is expected to be opened next June by new subsidiary, **Prince Edward Island Frosted Foods Ltd.**

Inland Empire Dairy Assn. producer of Darigold products at Spokane, Wash., has purchased equipment and routes of **Curlew Creamery Co.,** Spokane.

Ocean Garden Products, Inc., San Diego, plans to take over the fresh and frozen seafoods operations of **Marine Products Co.,** of the same city.

Pillsbury Mills, Inc., has started construction on a new plant in East Greenville, Pa. It will make company's complete line of refrigerated dough products.

A. E. Staley Mfg. Co., Decatur, Ill., has purchased the syrup business of **Shreveport Syrup Co.,** Shreveport, La.

Associated Industries

Canadian Thermo Control Co. Ltd., Montreal, has been formed jointly by **Thermo King Corp.,** Minneapolis, and **A. V. Roe Canada Ltd.,** Toronto. It will manufacture and market all Thermo King products not only in Canada but also throughout United Kingdom and sterling bloc countries.

Food Machinery & Chemical Corp., has appointed Fred Luhdorff as service manager of its Canning Machinery Div.'s western operation.

Joseph T. Ryerson & Son, Inc.'s new Indianapolis warehouse is now open for operations.

Minneapolis-Honeywell Regulator Co. has leased a new $300,000 plant in Fall River, Mass., for production of a new line of electronic industrial controls. George W. Hoffmeister is general superintendent of plant.

Owens-Illinois Glass Co.'s new Atlanta plant is now in operation.

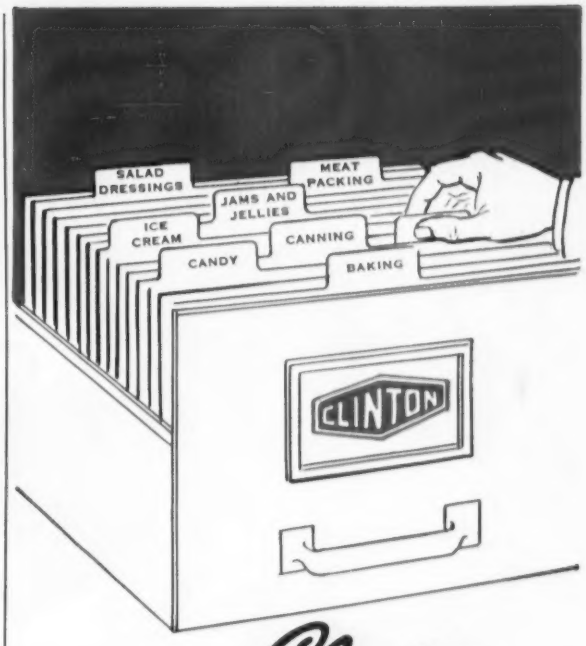
Deaths

William J. Davidson, 83, retired president of New England Div. of Great Atlantic & Pacific Tea Co.

Sherwood C. Gaddie, 61, superintendent of West Jordan plant of Utah-Idaho Sugar Co.

Harry M. Griffiths, 76, member of board and v.-p. of International Salt Co.

Prof. Harry B. Walker, 73, retired head of U. of Calif.'s Department of Agricultural Engineering and inventor of food processing machinery.



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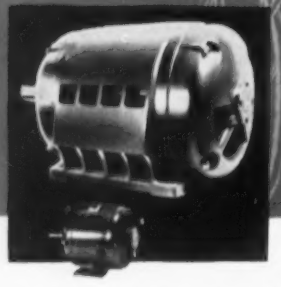

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An outstanding addition to the most complete line of Centrifuges in the industry!

- Instrumentation is complete—including autotransformer speed control, combination ammeter and electric tachometer, automatic timer, timer cutout switch, low voltage release and pilot light, steel guard bowl.
- Speeds up to 17,000 r.p.m., forces up to 34,390 XG.
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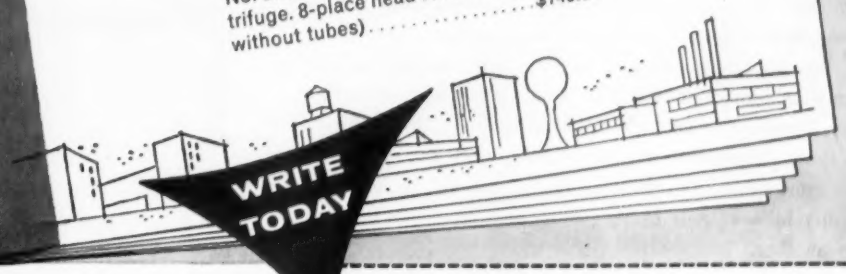
- Completely sealed 8 x 50 ml head. Adapters available for 10 and 15 ml tubes. Self-balancing controlled drive eliminates need for balancing head.
- Unit is 21 in. high, 14 in. wide, 17 in. deep. ½ H.P. motor. For 115 volts AC, 50-60 cycle single phase.

No. 59855—International Model HT Centrifuge. 8-place head for 50 ml tubes (but without tubes) $745.00



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when you consider
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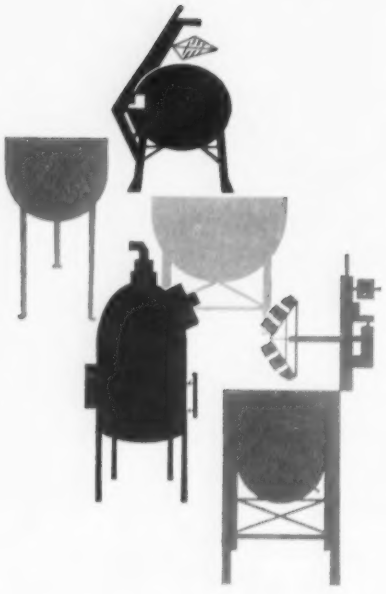
costs you

KETTLES OF CRUCIBLE STAINLESS COST LESS



Install a kettle made of Crucible Stainless Steel and you're certain of this: it can't alter the flavor or change the appearance of food. It never takes flavor *away* either. It effectively resists the really harsh processing liquors and never chips, peels, or cracks. And no foods, no matter what corrosive acids they contain, can break down its smooth, shiny surface. That's why Stainless Steel kettles cut product contamination that wastes money.

It's this ability to save money that accounts for the growing impact of Crucible Stainless on the food industry. Cleaning is another good example: Stainless cleans 5 times faster than any other metal. And it comes clean so thoroughly that Stainless equipment can be used on many jobs — flavor never carries over from one product to another.

In the long run, the more equipment you have made of Crucible Stainless, the less you'll pay to process food.

To get more facts about Crucible Stainless, take either of these simple steps: (1) write for free 40-page booklet discussing the use of Stainless Steels in the Food Processing Industry, or (2) contact Crucible Steel Company of America, The Oliver Building, Mellon Sq., Pittsburgh 22, Pa.

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ADVANCES IN TECHNOLOGY

Colored Potato Chips

Dyeing potato chips in various selective colors or shades, while retaining their appetizing flavor and keeping qualities, is the subject of a recently patented process.

The essential steps comprise (a) Peeling and slicing the potatoes; (b) washing to remove starch; (c) processing with hot water to remove sugar, (d) dyeing and cooking. Removal of sugar is imperative. Otherwise the brown color of the cooked chips will mask the dye.

After washing to remove starch, the raw chips are subjected to a hot water bath (160F.) for about 2 min. This is followed by another washing at 120F. for 5 min. The higher the temperature of the water, the whiter the raw chips, and the crisper after they are cooked.

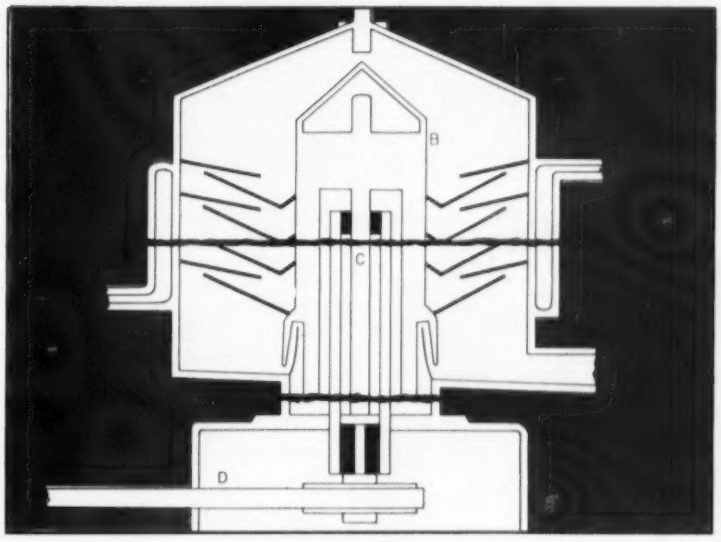
Then comes dyeing in a commercial product known as Ben Hur liquid food color. Different colors are obtained by mixing two or more of the base colors. One part of dye is mixed with 100 parts of water at 110F., and the chips are immersed for 1-3 min., depending on depth of shade desired. This is followed by the usual cooking operation.—U.S. Patent 2,789,056, Apr. 16, 1957.

Improved Sausage Casing

In sausage employing a sewed bung, a patented invention: (a) Prevents stretching of the bung when the sausage is hung for smoking; (b) minimizes handling with resultant saving of labor, and (c) eliminates conventional cooking in water.

Optimum advantages of the invention are secured when the strap for supporting the sewed bung is attached adjacent the crown end of the bung and stuffing is toward this end.

As a result of this procedure, after the sausage is stuffed and tied, it may be immediately hung on a tree where it remains for the subsequent operations of steaming, cooking, smoking, and chilling. Compared with conventional handling, the following steps are eliminated: Placing the stuffed sausage in a truck, removal from the truck, placing in a cooking vat, and removal from the vat prior to hanging on the smoking tree.—U.S. Patent 2,788,279, Apr. 9, 1957.



Continuous Buttermaking Machine

A unit for churning 36-42% butterfat cream continuously and having a capacity of 360-430 kg. butter per hr. has been developed in Czechoslovakia. Resulting product is said to have a consistency and quality similar to normally churned butter.

The machine comprises a vertical churning cylinder (illustrated above) and an inclined working section. Latter is provided with an injector through which minor ingredients such as salt or antioxidants can be incorporated in the butter.

The churning cylinder contains two sets of overlapping beating elements. One set is fastened to stationary cover (A), and the other to rotating disk (B) that is fixed to central shaft (C), which is driven by belt (D).

Cream enters top of cylinder and flows by gravity between the sets of disks where butter granules are formed. Mixture of granules and buttermilk then passes out of the cylinder and into the working section where the granules are pressed into butter.—*Prumysl Potravin*, 8 (5), 262, 1957. (In Czech)

Phosphates In Sausages

Addition of phosphates to components of bologna increases cohesion of the meat, reduces shrinkage when product is heated to an inside temperature of 160F., and has no appreciable effect on color during normal processing.

In the case of frankfurters, color development depends on length of time allowed during smoking and cooking. Rapid processed franks have less color when phosphates are used than with ordinary cure. But normally processed ones were superior when either sodium hexametaphosphate or a mixture of 70% tetrasodium-30% sodium acid pyrophosphate were added.—*Food Technology*, 450-56, Aug. 57.

Milk Sterilizing System

Novel feature of a new Belgian continuous bottled-milk sterilizing plant is employment of hot air instead of steam as the final heating medium. It enables a reduction in height of units from approximately 30 ft. to 16½ ft. The plant consists

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Exceptional emulsifying and saponifying powers scientifically balanced with rapid-action wetting agents for thoroughly removing stubborn fat and soil deposits. Ideal for hand cleaning of cookers, vats, fillers, etc. Rinses clean and bright. Tops in its field.

KLENZADE HC-6

Highly popular general cleaner especially useful on all wood and metal surfaces, tile, concrete floors, general processing equipment, ovens, hoods, etc. Rapid removal and dispersion of grease and heavy soil. Leaves no scum; rinses freely. Safe for hands.

FLASH-KLENZ

Non-corrosive organic acid detergent for cleaning high temperature equipment. Completely neutralizes and removes baked-on mineral deposits. The latest scientific approach to lime or "stone" dissolution. Eliminates abrasive methods.

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Concentrated sodium hypochlorite solution for bactericidal use in food plant operations. Rapid and effective for sanitizing all types of equipment. Clear solution, always ready for use. No dissolving or settling necessary. Leaves no sediment or residual film.

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and equipment for high temperature and heavy duty cleaning. Also fog sanitizing equipment and steam pressure cleaning.

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Advances in Technology

of a number of vertical chambers through which pass endless conveyors fitted with bottle holders.

In operation, milk is flashed to 266-75F. in a continuous sterilizer, cooled to 165F. and bottled. Then bottles pass through 2 preheating chambers containing water at 209 and 212F., respectively.

On emerging from the 2nd preheater bottles enter the sterilizing section, through which air at 240F. is circulated at 6,000 cfm. by a 10 hp. blower. Bottles remain in this section for about 25 min., and temperature of the milk is raised to 230F.

Cooling is effected by passing the bottles through 4 water columns. Temperatures here decrease from 210 to 120F. cooling the milk to about 130F. Further cooling is possible by use of cold water sprays. Capacity of plant is 2,000-4,000 liter bottles/hr. —*Zuivelbereid en Handel*, 62 (31), 630, 1956. (In Dutch)

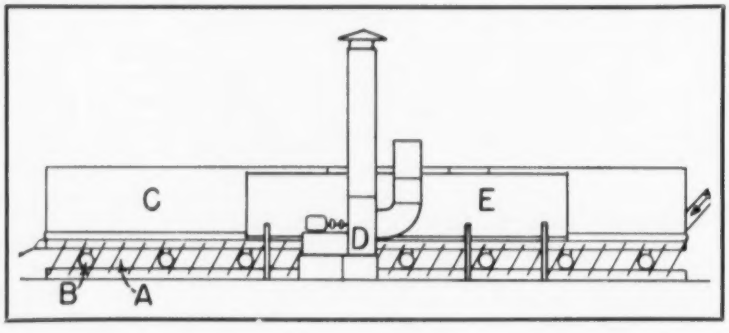
Milk Treatment In Sweden

About 40% of the milk consumed in Stockholm is treated by a recently developed process called Clarifixation.

The process is carried out at about 130-40F. in a specially designed centrifuge having a skimming bowl equipped with a stationary paring-homogenizing disk of large diameter. Bowl is so designed that the smaller fat globules are continuously discharged along with the heavier (skim milk) fraction.

The large fat globules move to the center of the bowl where they strike the paring disk and are broken into smaller ones. Then they are diverted into the skimming bowl and mixed with incoming milk to be re-separated. Globules that have been reduced sufficiently in size are then discharged with the skim while larger ones are again exposed to the paring disk.

The equipment is coupled to the regeneration section of the heat exchanger so that the treated milk is returned to the heating section and pasteurized. As in conventional clarifiers, impurities are eliminated as slime. — *Svenska Mejeritidn*, 49(11), 151, 1957. (In Swedish)



New Sugar Cooler, Dryer

A simplified method for cooling and drying washed sugar directly after centrifuging is now employed in a Dutch refinery.

The installation consists of tunnel (A in drawing above) which is divided horizontally into two compartments by means of specially designed louvres. Sugar is conveyed through the top section from centrifuges to bagging machines. In bottom section are installed a number of small fans (B) which blow air through the louvres and the moving bed of sugar crystals.

Depending on whether product in centrifuges is washed with water or steam, heat may be required to dry the sugar. When drying is necessary, fans at entering end of tunnel are equipped with heaters. Then remainder force cold air through the mass to cool it.

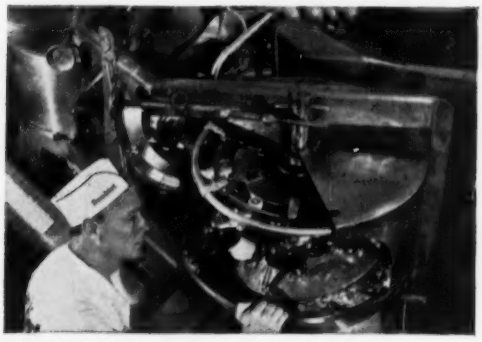
Air discharges from tunnel to hood (C) equipped with exhaust fan (D) that forces air through cylindrical wet dust collector (E). Here, a screen of water dissolves the fine particles of sugar carried over by the humid air. As the resulting syrup becomes concentrated it is returned to the juice tanks and replaced with water.

Advantages of the system are: (1) Reduction in damage to the sugar crystals; (2) separation and recovery of the dust, and (3) minimum of floor space and foundations required. —*Food Manufacture*, 369, Aug. 1957.

(*turn page*)

One look at the huge, sprawling buildings at one of the Exchange Products plants and you know that big things are happening inside. For here *citrus* is king. Trucks pour in with fresh fruit from groves all over California and Arizona. Conveyer belts hum along in every direction. And Exchange products are shipped to nearly every part of the world.

Why 'Exchange' products serve you better



Utmost cleanliness is the watchword at Exchange Products plants. Everything has that "just washed-down" look. Every four hours, extraction equipment is completely cleaned. Every third day, the entire plant closes down for a thorough washing.

Exchange quality is assured by constant checking in extensive testing laboratories. In fact, rigid quality controls have been set up *throughout* the plant to make sure that every product measures up to Exchange quality. Sunkist produces more than 400 different citrus products.

The world's largest citrus research department is maintained by the Sunkist Growers to develop new growing methods, to improve manufacturing processes, and to perfect better products. Today, with a backlog of more than 60 years experience, Sunkist has accounted for 118 separate U.S. patents.

Just three of many Exchange products are *Exchange Preserver's Pectin*—guarantees a more uniform finished product; *Exchange Low Methoxyl Pectin*—jells *without* sugar, tasteless, controls "weeping" in pies; *Exchange Lemon Juice*—brings out natural flavor of *any* food. Superior acidulant, excellent anti-oxidant.

Sunkist Growers

PRODUCTS DEPARTMENT • ONTARIO, CALIFORNIA

Distributors for

Exchange Lemon Products Co., Corona, Calif. • Exchange Orange Products Co., Ontario, Calif.

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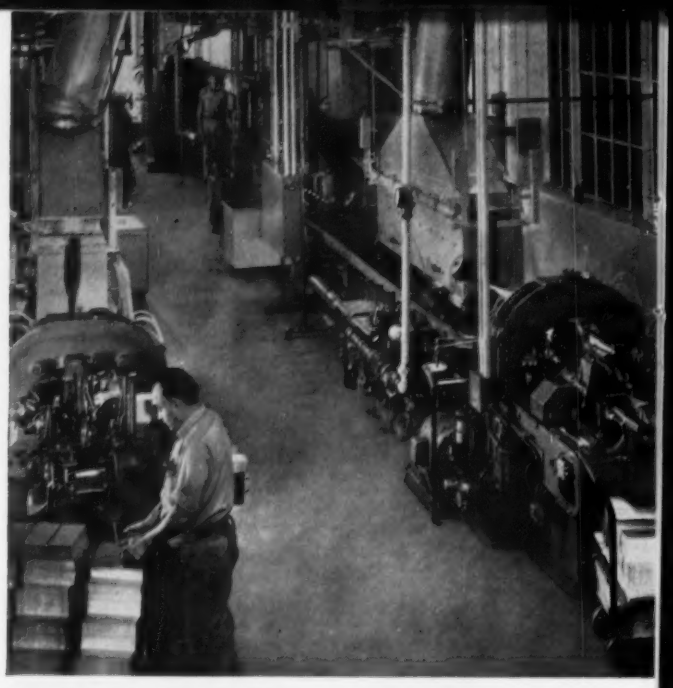
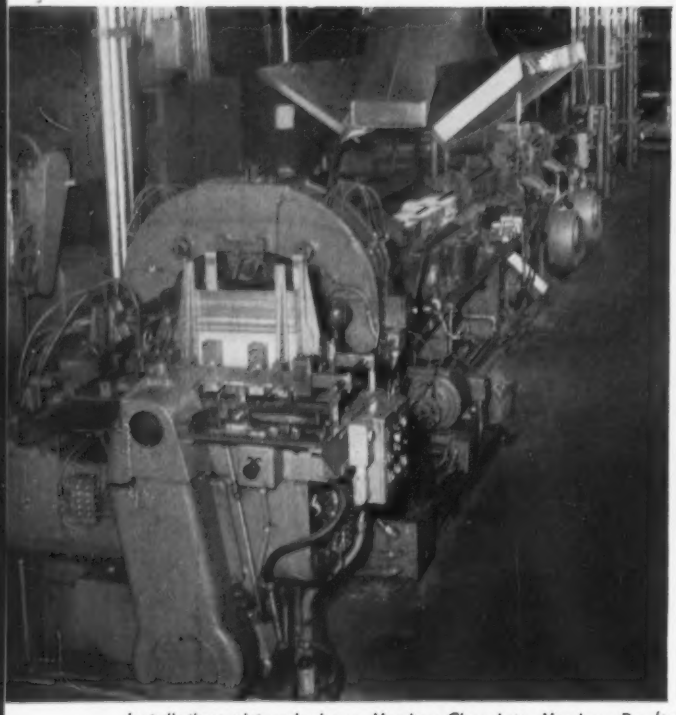
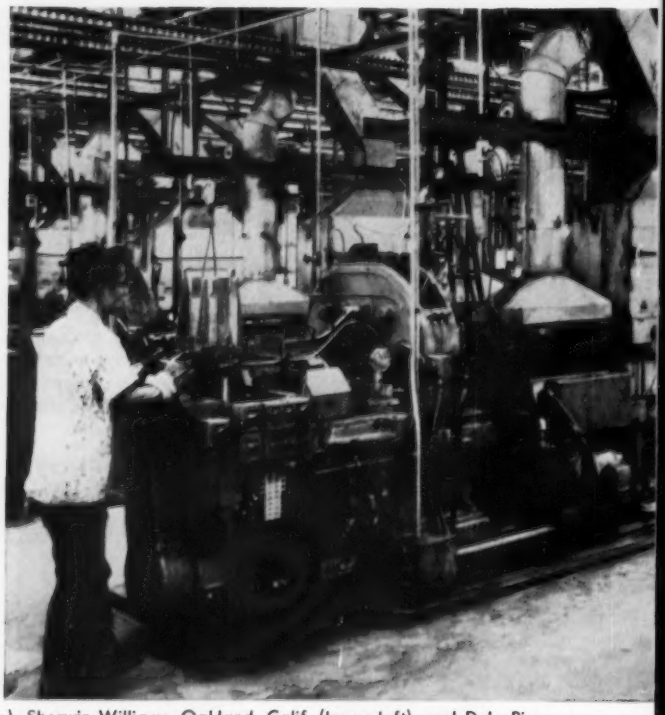
Hamilton new 501 bodymakers are in service at many well-known plants







Installations pictured above, Hershey Chocolate, Hershey, Pa. (top); Sherwin-Williams, Oakland, Calif. (lower left); and Dole Pineapple Honolulu, indicate how leading packers have chosen Hamilton's new 501 Bodymaker to meet can requirements efficiently.

The main feature of Hamilton's new No. 501 Bodymaker is its central drive shaft. This unusual design results in fewer wearing parts and gears and improved accessibility.

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Sugar Filtration Tests Influenced by Salts

Filterability of raw sugars is often tested in the laboratory with a Dawson-type pressure filter and diatomaceous earth.

The test is an arbitrary one and useful, but frequently its indications do not correlate well with behavior of sugar in refinery filtrations. For filtration rates of pure sugar solutions are considerably affected by presence of salts.

A 0.25% solution of $CaCl_2$ filtered 43% faster than the distilled water from which the solution was made, and K, Ca, and Al Cl_3 in solutions of pure sucrose (60% sucrose with 0.16% salt based on the sugar weight) increased filtration rate 17.5-49.3%. Behavior of raw sugar solutions is more complex, but their filtration rates can be altered by changing pH and by addition of salts.

Variations in filtering rate of sugar solutions seems to be due to interactions of the salts present in the sugar and in the water used for dissolving it, with the colloids of the sugar and with the diatomaceous earth, which is not the completely inert material in filtration that it is generally believed.—*Ind. & Eng. Ch.*, 904-6, May, 1957.

Fat Extraction of Flours Gives Strength to Gluten

Gluten, a highly proteinaceous component of wheat flour, always contains a relatively large amount of fatty substances, bound to it by a phosphatide such as lecithin.

The choline-phosphoric acid portion of the phosphatide is oriented toward the protein of the gluten and the fatty acid end of the molecule binds the fats.

It is this gluten-phosphatide-fat complex that makes washing of gluten from low-grade flours such a difficult job, and that is responsible for the characteristic extensograms of these flours.

If the flour is extracted with a fat solvent, the gluten washed from it is much stronger and more resilient. It also oxidizes much more rapidly and takes on a rancid odor, suggesting presence of unsaturated compounds on the protein surface. On extraction of the fat-free gluten with alcohol or alcohol-benzene to remove phosphatides, the ductility and elas-

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Other Compressors to 6000 Horsepower

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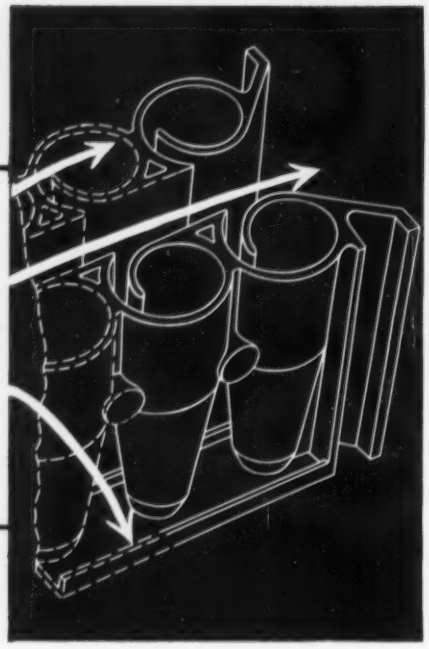

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- Cranberry Juice
- EDIBLE OILS
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- LARD
- MILK
- MOLASSES
- ORANGE JUICE
- PECTIN
- PIE FILLINGS
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- PRUNE JUICE
- SOFT DRINKS
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SOLUTION:
Use unequalled high efficiency APV Self-cleaning Paraflow Plates. No possibility of overheating delicate flavors (juice temperature cannot exceed the temperature of the hot water used for heating). Extremely rapid flash heating and/or cooling cycle in a single Paraflow Unit. Capacities and temperature duties are easily changed. Q.E.D.

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. . . at LESS COST
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Advances in Technology

ticity were lost, but swelling in water still took place.

Baking properties of low grade flour can be improved by fat extraction, partly because of decreasing the lubrication between gluten particles, but mostly because of the greater susceptibility of the extracted flour to oxidation. Copper salts accelerate the oxidation effects which are much more pronounced in fat-extracted than in unextracted flours. The natural fats of flour are a regulator for oxidation of its protein system.—*Revue des Fermentations et des Industries Alimentaires*, 11(6), 261-70, 1956 (In English.)

Dextrose Forms Antioxidants In Cookies During Baking

Addition of a small amount of dextrose to sugar cookies retards the development of organoleptic rancidity, and increases their shelf life approximately 70%.

This was demonstrated by storage studies involving cookies made with 60% sucrose, and with 55% sucrose, 5% dextrose. Former did not brown noticeably, contained only small amounts of reducing sugars, and no reductones.

Dextrose-containing cookies browned during baking, and had about 4 times more reducing groups than the sucrose ones. They contained detectable quantities of reductone-like compounds.

When stored at 67.7% RH, rancidity was detected in the sucrose cookies after 24 days, and in the dextrose containing ones in 40 days. At 11.1% RH rancidity developed after 64 and 96 days, respectively.

Tests indicate that reductone-like compounds, formed during the browning reaction in the dextrose cookies, contain antioxidants that delay fat oxidation during storage.—*Cereal Chemistry*, 159-69, May 1957.

Detection of Peel In Orange Drink

Orange beverages made by crushing whole fruit can be distinguished from those made from the juice only, by chromatography of a benzene extract, followed by spectrography of a specific fraction eluted from the chromatography column.

A sample of the drink (25 ml.) is extracted with three 10-ml. portions of benzene which are then passed

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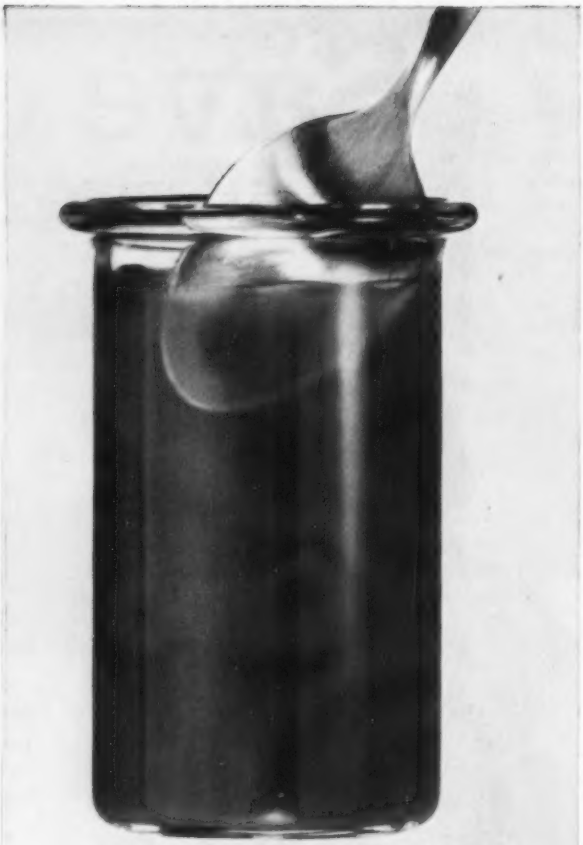
SEPARATED AND CLOUDY
—when thickened with flour or ordinary starch.



UNAFFECTED
—when thickened with National's COL-FLO.

How gravies react to freezing and thawing

These are actual gravies. Photographed after freezing and thawing. They were made at the same time. Handled the same way. Their formulas differ only in thickening agent. Yet look what's happened to the gravy thickened with flour. Compare it with smooth, appetizing gravy thickened with COL-FLO, a special National starch.

Which would you choose for your frozen foods?

Why not see for yourself how COL-FLO safeguards the quality of sauces and gravies from freezing to eating. Write for a free sample and data sheet.

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through an alumina column. After washing the column with an isopropanol solution in petroleum ether, an elution with acetone in petroleum ether removes the distinguishing fraction.

Fraction is evaporated to dryness, dissolved in chloroform and the absorption coefficient of the solution is measured at 325 mmu.

Drinks made with whole oranges have a higher absorption coefficient (0.3-0.9 on a Unicam spectrophotometer) than those made from juice only (less than 0.2). The substance responsible is not present in orange oil, but is derived from other portions of the peel.—*Chemistry & Industry*, 734-35, June 8, 1957.

Crispy Carrot Product

A precooked food product made from comminuted carrots is the subject of a recent patent.

In its manufacture, fresh raw carrots are washed and comminuted to a relatively coarse size. Product is then fed to a liquefier which produces a thick-pouring liquid, consistency of which is reduced by draining off as much fluid as possible.

Paste-like product is then mixed with a starchy binder and a suitable leavening and flavoring materials, forming a dough that can be rolled into chips or extruded in spaghetti form.

Material is immediately dropped into hot deep-frying oil and cooked to a crispy, crunchy consistency. The product has a golden brown color and a pleasing carrot flavor. It retains a high percentage of the valuable minerals and vitamins.—U.S. Patent 2,785,981, Mch. 19, 1957.

Coffee and Tea Extracts Spray-Dried as Foam

Better control of bulk density, particle size, and color is claimed for a patented method of spray-drying in which solution to be dried is first converted into a foam by admixture of a gas.

The process is particularly applicable to drying aqueous coffee and tea extracts. Here it yields a coarse, granular product which is preferred to fine powder because of its free-flowing characteristics, improved rate of solution, darker and more attractive appearance.

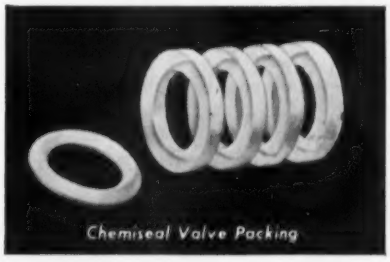
By way of example: Coffee extract containing 55% solids was pumped

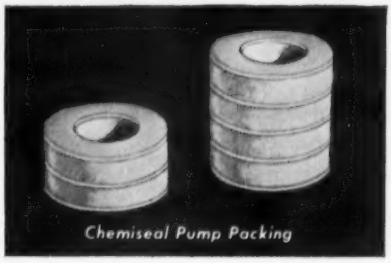
specialists . . .

IN FOOD PLANT PACKINGS AND GASKETS

Made of du Pont TEFLON
Chemiseal Teflon Jacketed Gaskets for Standard flanges and glass-lined steel connections. Catalog AD-154
Chemiseal Teflon Jacketed Gaskets for corning conical flanges. Catalog AD-154

Chemiseal Packings and Gaskets were designed by specialists for corrosion, contamination and sanitation problems in the food and chemical industries. Designed of chemically inert TEFLON, du Pont's wonder plastic that laughs at food acids, alkalis, solvents—that withstands sterilizing temperatures—that is extremely anti-hesive—Chemiseal Packing and Gaskets are fast replacing other types throughout the food industry.


Chemiseal Valve Packing


Chemiseal Pump Packing

CHEMISEAL TEFLON-JACKETED GASKETS are available in any size, with a variety of filler materials suitable for glass, glass-lined, porcelain-lined and metal piping equipment. These fillers are protected on both faces and the inside diameter by the inert TEFLON Jacket. Catalog No. AD-154.

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CHEMISEAL PUMP PACKING is extremely effective for rotating and reciprocating shafts. Provides a low friction 2-way seal that not only prevents axial seepage, but also seals against shaft and stuffing box as well. Supplied in sets to meet specific requirements. Catalog No. AD-155.

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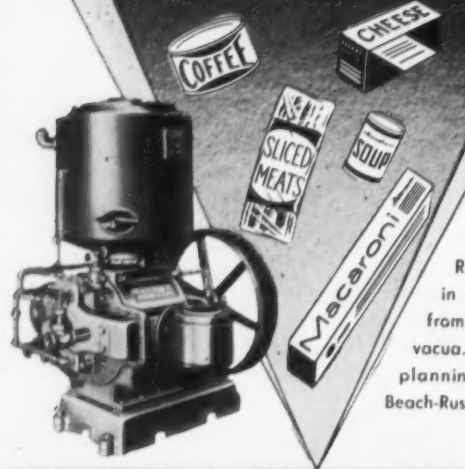
VACUUM *Specialists* FOR THE FOOD INDUSTRY



To the consumer "VACUUM PACKED" implies freshness and dependability — vital selling points for all food products — from "soup to nuts." Beach-Russ is a pioneer in aiding food processors and food equipment manufacturers in devising new methods of processing and packaging — of guaranteeing product quality — through the use of vacuum. Beach-Russ Vacuum Pumps are available in types and sizes to meet all needs from 1 to 1800 c.f.m., at high or low vacua. If you need technical advice in planning a new installation, contact Beach-Russ. *Write for Bulletin 89.*

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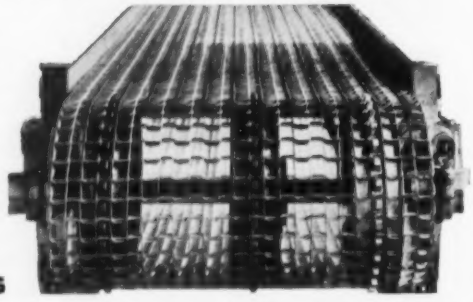

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Advances in Technology

at 40 psi., and a controlled flow of CO_2 gas was introduced into the extract at the same pressure. Combined flow of gas and liquid was then raised 150 lb. pressure with a booster pump and discharged to a high-pressure reciprocating dryer feed pump in which the foam was compressed and raised to the 4,000 psi. Density of the foam at the high-pressure pump measured at atmospheric pressure was adjusted to 0.5 g./ml.

Bulk density of the spray-dried product was 0.25g./ml. It was dark in color, of coarse particle size, and readily soluble in hot or cold water. Similar results were obtained with tea extract.—U.S. Patent 2,788,276, Apr. 9, 1957.

Counterflow Regeneration Of Ion Exchange Beds

Experimental use of upflow instead of conventional downflow regeneration of exhausted exchanger beds has led to development of counterflow regeneration with attendant economy and decrease in cation leakage of sodium ions.

In upflow regeneration the exhausted sodium band is first contacted with fresh acid, and the bottom part of the bed is most completely regenerated.

It was soon found, however, that the low density of modern resins led to channeling with resultant poor contact, low capacity, and poor effluent quality. This was overcome by placing a barrier at the top of the bed. This holds it in compact form and insures optimum contact between acid and resin.

A screened distributor was placed at the bed level, and as regenerant acid was introduced at the bottom, an opposing flow of water was brought in at the top. Combined streams were taken out at top of bed. With proper adjustment of the two flows, expansion of the bed was insignificant.

Tests were made with counterflow and convention regeneration, using water containing 50% sodium and 17% alkalinity. Effluent produced by counterflow was of substantially higher purity throughout. Conventional downflow regeneration gave an average of 2.7% leakage, upflow produced 6.9%, and counterflow averaged 1.2%. Industrial installations have confirmed the experimental results.—Paper presented at American Power Conference, Chicago, March 28, 1957.

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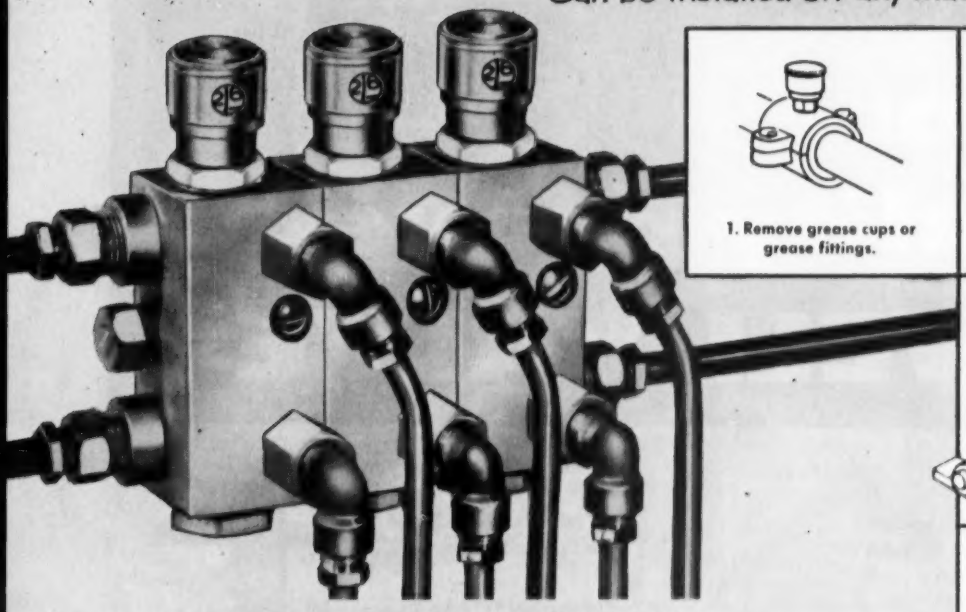
Can be installed on any machine in 4 easy steps!



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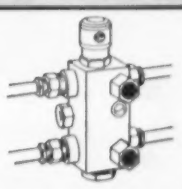
Handles difficult multiple-bearing lubrication under all conditions. Fully sealed for clean lubrication of power shovels, cement kilns, conveyors—any outdoor or indoor installation. Operates whether completely immersed in fluid . . . covered by dirt or grit . . . or protected by anti-corrosive paint. For fluid oil or light grease. Four sizes, delivering from .050 to .500 cu. in. of lubricant.

Fully hydraulic—no springs to adjust or replace.

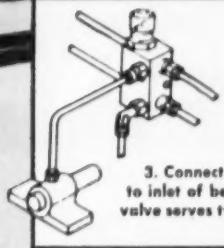
Now available with Lubrication Recording Cycle Counter—for a fully automatic record of bearing lubrication!

Tests show no appreciable variation in the amount of lubricant discharged after 73,312 cycles—equal to *122 years of twice-a-day service!*

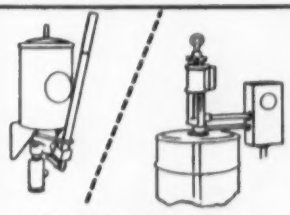
1. Remove grease cups or grease fittings.



2. Connect each valve in system to its two lubricant supply lines.



3. Connect valve outlets to inlet of bearings. (Each valve serves two bearings.)



4. Provide central pump for supplying lubricant to system.

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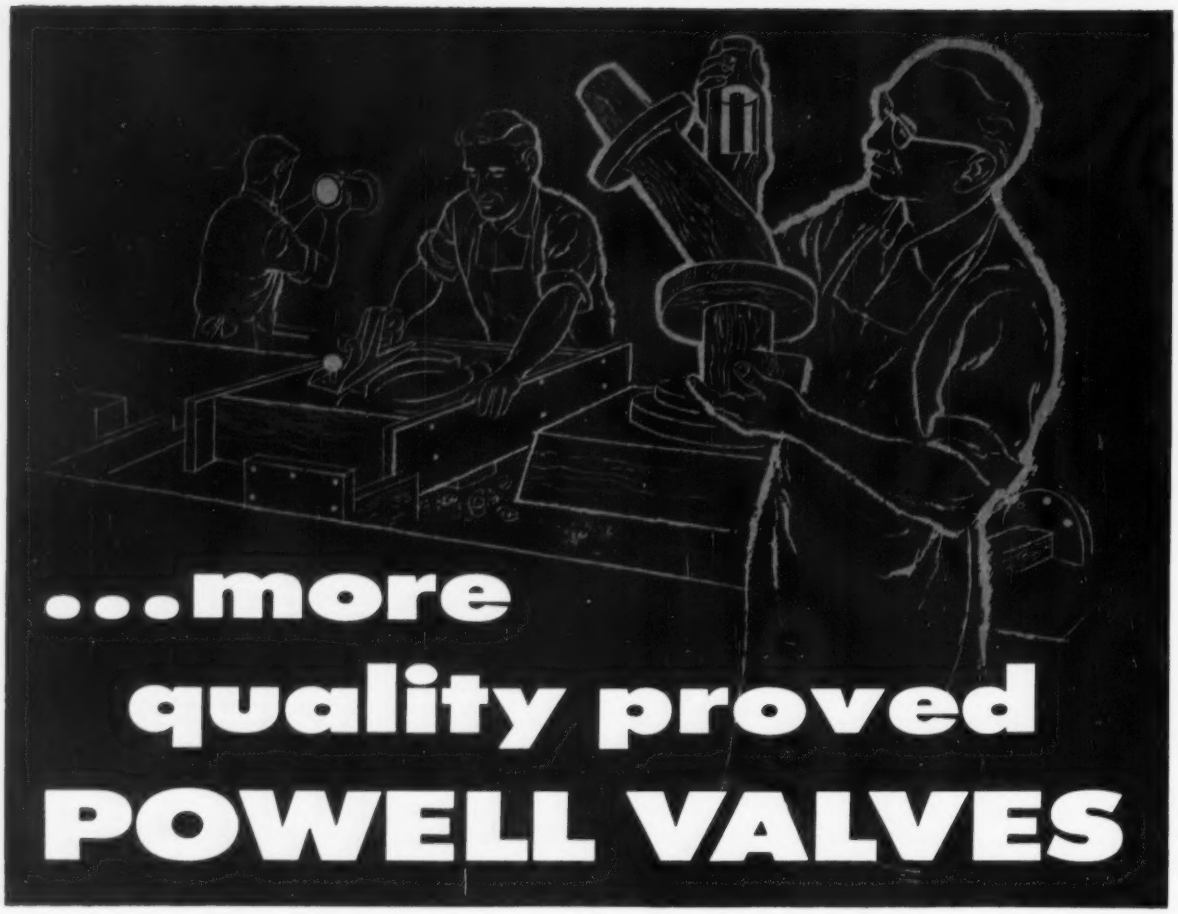

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Fig. 2337—Stainless Steel Gate Valve for 200 Pounds W.P. Screwed-in Bonnet. Inside Screw, Non-rising Stem.

Fig. 1847—Small Stainless Steel Swing Check Valve for 200 Pounds W.P.

Fig. 2491—Stainless Steel O.S.& Y. Gate Valve for 150 Pounds W.P.

Fig. 2107—Stainless Steel "Y" Valve for 150 Pounds W.P. Outside Screw Rising Stem and Yoke.

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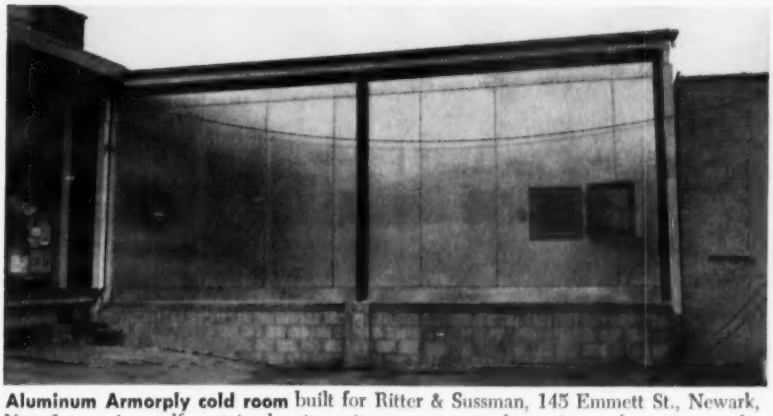
Frozen food executive ***Philip E. Ritter*** *tells why he chose* ***Armorply*** *—*

"We needed sub-zero storage space in a hurry . . . and got it with an Armorply cold room"



Aluminum Armorply cold room built for Ritter & Sussman, 143 Emmett St., Newark, New Jersey, is a self-contained unit on its own concrete base. Armorply rooms can be built indoors or outside. Note the window which permits loading directly from box.

Armorply-faced sections are bolted together fast. That's why rooms can easily be moved, expanded or altered in shape with untrained labor.

Q. What led to the installation of your Armorply cold room?

A. If we wanted to keep our 100 employees and 15 trucks going, we needed more storage space . . . and needed it fast. Just as important, because our business is growing so fast, we wanted a cold room that could easily be expanded. We looked 'em all over . . . and found that Armorply cold rooms as manufactured by Freezer Box Division, Annapolis Yacht Yard Inc. filled the bill best.

Q. How long did it take to build your Armorply room?

A. After the floor was down, both the unloading of the prefabricated sections *and* the assembling of the room took just one week. Full instructions made the workmen's job easy.

Q. Where is your Armorply room located?

A. Just where we wanted it. Outdoors, next to our loading platform. Only a concrete base and a rain-shedding roof were required to insure dependable operation.

Q. How big is your Armorply room?

A. It's 32' x 30' x 9'. And it holds over 80,000 pounds because there is no waste space. The walls have no troublesome projections, so we have no trouble stacking or moving food.

Q. Is it easy to maintain sub-zero temperatures in your Armorply room?

A. Believe it or not, we were able to cool the room down to −10° in just 24 hours. And we have no trouble maintaining those sub-zero temperatures because there are actually 8 inches of Fiberglass in the walls.

Q. What other Armorply features impress you?

A. Our Armorply room is moisture-proof and verminproof. And it stays clean and nice looking inside and out. It's really helped our business already, and will help us even more in the future.

★ ★ ★

Armorply is waterproof plywood with a face of stainless steel, aluminum, monel, copper or any other metal permanently bonded to one or both sides. Armorply panels are lightweight, remarkably strong and easy to fabricate. Armorply cold rooms are comparable in cost to ordinary plaster and insulation units.

Nailing aluminum to cover joints . . . gives a smooth, easy-to-clean surface.

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FREE: Please send me free sample of Armorply and descriptive literature. ☐
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Only this new Bliss Duplex Slitter can save you so much time

You can slash hours off every cutter regrind with this new slitter. That's because the first table retracts almost two feet—lets you get right in at the cutters. Simply attach the motor-driven grinder, then sharpen the cutters in place.

This accessibility also simplifies set-ups and changeovers. And making things even easier is the exclusive design of the bearing housings—they're quickly removed, easily replaced. The side and back gages, too, are easy to reach and adjust, speeding up the entire process.

In short, Bliss' new duplex slitter cuts the heart out of downtime. It saves hours every time you sharpen or set cutters. Whether you slit body blanks or trim and square tinplate, you'll like the accuracy and speed of this most modern of slitters. For complete information write for a copy of our new slitter catalog.

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QUESTIONS & ANSWERS

THIS MONTH'S PROBLEM

Erratic Cartoning

Question: Last fall we replaced a hand-cartoning operation with an automatic high-speed unit. It operated perfectly until the winter, when we started to get erratic results. Tearing and jamming of cartons caused considerable time loss, although we hadn't changed our method of operation.

After a while, the difficulty seemed to correct itself, but during the recent summer months, we again had trouble. It doesn't seem likely that the operation of such a machine would be affected by weather, still we haven't been able to find any other variable. Do you have any idea of what might be happening?

JULY PROBLEM

Fuel Savings

Question—With the recent rise in fuel prices, our profit margin has been further shaved. Consequently, our management has ordered intensified efforts to reduce costs. Someone has suggested that a "heat balance" study should prove helpful. Trouble is we don't know just what this is or how to go about it.

But we don't want to miss any reasonable opportunity to make savings. Can you give us some pointers?

Answer—A heat balance is an analytical tool of the mechanical and chemical engineer, and it can be profitably applied to food-plant operations. It is simply a tabulation equating total heat input and output and losses.

The chief input item usually is the heating value of fuel fired to your boiler. Other heat sources are gas-fired and electrically-heated devices, which generally are readily evaluated in terms of Btu's in the gas, or kw.hr. input. You will have to choose a time basis for this study, so that you will have heat input per hour, shift, day, week, etc.

To measure heat input to the boiler, you will need scales or meters to measure the fuel consumption accurately. Also, fuel heating values in Btu. per lb., gal., or cu. ft. must be determined.

Accounting for where the heat goes is more involved. First losses occur in the stack gases, unburned fuel, radiation, etc. Their evaluation requires a controlled "boiler test", in which many measurements must be made over a period of sustained operation. This test is complicated, thus it should be made by your engineer, if qualified, or by a consultant.

There is further heat loss whenever your product comes off the line at higher-than-room temperature. Heat goes to the atmosphere during cooling, and the loss can be estimated from weight of product and its specific heat.

Heat loss from buildings is particularly important during the cold months. This, again, is best evaluated by a specialist.

Hot water used in cleanup represents another heat loss. By moving a flow meter and temperature recorder from one use point to another, amount of Btu's. in the hot water can be determined. This is literally heat loss "down the drain."

You may find it surprising, as you study the distribution of heat in your own plant, that considerable heat is rejected in cooling water—through heat-exchangers, condensors, cooling canals, cooling towers, etc. It is here that a heat balance may start to pay off.

For example, it may be possible to pipe this partially warmed (but uncontaminated) water to a collecting point and use it for pre-heating cold incoming water going to boilers or water heaters. Or by means of suitably designed heat-exchangers, you may be able to transfer these Btu's. (already paid for) to some of your operations—pre-heating of fluids that are to be pasteurized or concentrated.

All the heat thus conserved and re-used adds to the overall efficiency of your plant, which after all is your real goal.

Other savings will doubtless be pointed out by your heat balance. They might include such things as improving combustion through automatic controls, and insulation to minimize radiation losses from pipes, tanks, and buildings.

Canadian Reply

We suggest your reader refer to Chapter XXIX of "The Efficient Use of Fuel," published in the United Kingdom by Her Majesty's Stationery Office for the British Ministry of Fuel and Power.

This chapter deals with graphical heat balances and, in conjunction with the remainder of the book, makes it a simple matter for anyone to analyze his fuel problems.

In the sugar industry, efficient use of fuel is of major importance and much attention is given to the subject. Consequently, we are familiar with the compilation of heat balances.—*J. H. Magee, General Refinery Manager, Canada and Dominion Sugar Co., Ltd., Montreal.*

Janitor Work Schedule

Question—We're interested in setting up a daily and weekly type of work schedule for janitors employed in each of our many branch buildings. Can you furnish them?

Answer—Here's a schedule of janistor's duties that might be of value. It was worked out by the Central Engineering Dept. of Omar, Inc., Omaha.

Daily:

1. Sweep office floor.
2. Mop office floor or buff with floor polisher, depending upon degree of cleanliness.

HOW TO DO IT?

Readers are invited to submit to FOOD ENGINEERING answers to question, "This Month's Problem." Selected answers will be published with credit (unless you specify otherwise). We pay space rates.

JUST ASK US

Subscribers also are invited to send in food engineering questions. We undertake to provide answers free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

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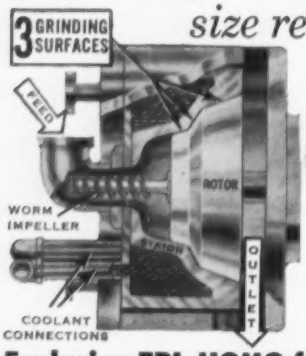
for homogenizing, emulsifying, particle size reduction in a single pass



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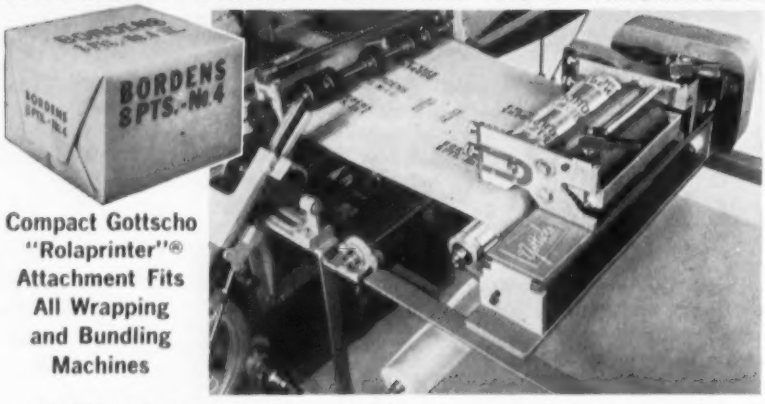

Compact Gottscho "Rolaprinter"® Attachment Fits All Wrapping and Bundling Machines

Ideal for imprinting anything from a code-date on a preprinted wrapper to complete display copy on 5 sides of a bundle overwrap. Fully automatic . . . requires no attention during operation, synchronizes with parent machine at regular production speeds . . . provides accurately positioned imprint. A miniature flexographic printer, the ROLAPRINTER attachment uses fast-drying liquid inks of any color and stick-on rubber type or dies. Assures consistent quality on all *films, foils* and *papers*. Mechanically simple . . . copy changes and adjustments for different wrapper sizes can be made quickly by untrained personnel. Models available to imprint areas from 1" to 24" wide.

For complete information please submit details of your requirements, including make and model of wrapping machine.

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Dept. V, Hillside 5, N.J.
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Automatic Production-Line CODING, MARKING, IMPRINTING MACHINES

Questions & Answers

3. Dust office furniture and desks, and empty all ash trays.

4. Clean toilets and plumbing fixtures. Replace toilet paper, soap, and paper towels.

5. Replace burned out fluorescent lamps in office ceiling fixtures, burned out incandescent lamps in loading room and garage-ceiling fixtures, and front flood lights.

6. Empty all waste containers in office, toilets, and loading room, and dispose of trash from building.

7. Pick up soft drink bottles and return to rack in office.

8. Sweep loading-room floor and remove accumulated mud from trucks to exterior of building.

9. Clean floor drains and sump pits in loading areas and remove mud from building.

Weekly:

1. Wash loading-room floor, using care to keep water off walls and fixtures.

2. Clean and check lubrication of power lawn mower during lawn season. Keep blade sharp.

Monthly:

1. Clean venetian blinds in office area.

2. Wash windows in office areas and across front of building, interior and exterior.

3. Wax asphalt-tile office floor, strip old wax from floor and rewax, as required, to preserve finish.

4. Clean office-light fixtures.

Every Three Months:

1. Check fire doors to make certain they are unobstructed and operate freely.

2. Wash all windows in loading room, garage, interior and exterior.

3. Clean ceiling-light fixtures and window sills in loading room and garage.

Every Six months:

1. Clean gravel, etc., from roof gutters.

2. Clean and lubricate unit heaters, electric overhead-door operators, toilet exhaust fan, meeting-room exhaust fan, and well-water pump.

3. Clean dust from interior of drinking water cooler. Oil motor if mechanism is open-type unit.

4. Clean filters on office unit heater or furnace.

5. Clean and wax front aluminum entrance trim and canopy.

6. Clean and wax front sign and retouch any chipped areas in porcelain enamel.

7. Check all fire extinguishers to make certain they are full and arrange for refilling as required.

Yearly:

1. Spray lawn areas in spring

getting there is only half the job!

CAPACITY

Choose from ½ to 3 H.P. in Copelametic, the direct-drive accessible hermetic, and economical belt-driven models. Model TR-100 shown.

DEPENDABILITY

Thousands of Copeland units now in use have given years of trouble-free, over-the-road service—proof of superior engineering, ruggedness and dependability.

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Our unexcelled coast-to-coast network of 130 wholesalers and over 25,000 refrigeration dealers means the best in service when you need it. It's only a phone call away.

Copeland refrigeration does the rest . . . keeps food fresh!

This Indian's way of transporting venison back to the feast was picturesque . . . and that's about all. Today to avoid spoilage and flavor loss, we turn to refrigeration for practical reasons: freshness and profit. Fleet operators and food processors protect in-transit payloads with refrigerated trucks equipped with dependable Copeland units.

Whether holdover or over-the-road, a Copeland unit protects valuable perishables. Plugged in at stops, or driven directly, a Copeland truck unit produces cooling you can count on all the way . . . at lowest cost per mile.

SINCE 1918

Copeland REFRIGERATION CORPORATION, Sidney, Ohio

WRITE FOR SPECIFICATIONS AND PERFORMANCE DATA

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New Armalite* insulation is strong, light, efficient

Armstrong Armalite is a brand-new, board-form insulation for cold rooms operating at temperatures as low as minus 50° F. Armalite is a white, cellular material with an unusually low K-factor of 0.24 Btu at 70° mean temperature. It's light in weight for easy handling, only 1.25 lbs. per cubic foot—yet has ample strength to resist on-the-job breakage and to support loads. Armalite has a resilience that allows tight joint construction, and its dimensional stability in service is excellent. Boards are 12″ x 36″, in 1″, 1½″, 2″, 3″, 4″, and 6″ thicknesses.

Armstrong Armalite is one of the many fine products in the complete line of Armstrong Insulations. Armstrong offers you a full contracting service, geared to install these materials efficiently and economically.

* TRADE-MARK

Armstrong INSULATIONS

for temperatures from −300° F. to +2000° F.

Free Booklets

Armstrong Armalite, a New Foamed Insulation for Low-Temperature Rooms

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For full information write today to Armstrong Cork Company, 2109 Seventh St., Lancaster, Pa.

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with solution of 2-4-D weed killer.

2. Coat wood parking bumpers inside loading room and loading-dock door with hot linseed oil.

3. Touch up painting in toilet rooms, office areas, exterior doors, propane tanks, and miscellaneous exterior iron work on building and roof.

4. Replace shrunk or deteriorated caulking on stone window sills, coping, and horizontal joints.

5. Replace filter in office unit heaters or furnace.

6. Fill tar expansion joints in concrete pavement and interior concrete floor of loading room around walls, columns, etc.

7. Paint steel parking rail around parking lot and driveway to prevent rust spots from developing.

8. Refold fire hose in racks.

9. Clean acoustical tile ceiling in office areas with wall-paper cleaner; more frequently, if required, around ceiling air outlets.

As Required

1. Mow lawn areas and trim shrubs and vines during growing season.

2. Clean sidewalks and driveways of snow.

3. Minor electrical repairs to extension cords and attachment plugs.

4. Bleed water from well-water tank to maintain proper air chamber and eliminate pump short-cycling.

5. Rake loose gravel from edges of parking lot and gravel drives back into holes, which may occur in traffic areas.

Making Liver Pudding

Question—Do you have any information on manufacturing a product that the old Germans call liver pudding? From what we've learned, this product was made from head meat of the hog and offal. It's stuffed in beef rounds, string tied, and not smoked.

Answer—From what we've been able to find out, such a product can be prepared from 50% cooked head meats (or jowls) and 50% liver. Even a 50-50% combination of pork trimmings (50% lean meat) and liver.

Meats are then ground and chop-mixed in a silent cutter along with liver-sausage spices. Optional ingredients for a 100-lb. batch might include 5 lb. of fresh onions, 3½ lb. of non-fat milk solids, and the regular amount of cure.

Now stuff the meat emulsion into casings (9-in. circumference) and

ATLAS

"INDIVIDUALLY ENGINEERED"

FURNANE FLOORS

...the only permanent solution!

A mere corrosion-proof floor is not the complete answer to the problem of providing a permanent base for food processing operations.

Sometime ago Atlas realized that in the construction of a successful corrosion-proof food plant floor, more factors must be considered than just the nature of the corrosive products involved—factors such as attractive appearance, temperature variations present, type of cleaning detergents used, possible physical abuse and wet conditions normally encountered.

The Atlas "Individually Engineered" concept takes all these aspects into consideration in offering, for the first time, a truly permanent solution to your flooring problems. Naturally, you also get positive protection against the whole range of corrosives, from the mildest food acids to the strongest cleaning agents.

A Furnane Floor offers lasting beauty, long service, and assured installation techniques, all combined in a custom-installed and "Individually Engineered" flooring to meet your specific requirements.

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

Write today for the booklet, Food Floor Facts, giving complete information. Consult the Yellow Pages for your local representatives.

For more data, circle this page number on card at back →

NOW..

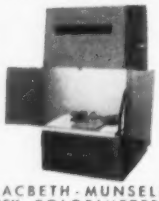
a complete line of quality control lighting for

COLOR QUALITY GRADING!

We all know that one of the biggest grade factors, in the food-field, is COLOR. But do you also know that it is impossible to effectively grade for color, unless the light source you are using, itself contains controlled amounts of ALL COLOR? For instance, if you are now using ordinary "run-of the mill" fluorescent lighting for critical color evaluation, it is actually possible that you are down-grading your product, colorwise! Macbeth Daylight has long been the accepted standard for visual color appraisal, in every industry where an accurate duplication of natural daylight is required. Institutions, government agencies, and private industry, have tested and approved this equipment for use in all phases of the food field. Prove to yourself that you can begin "up-grading" your fresh and processed products, and increase their customer appeal through the use of Macbeth Daylight. Make the test today!

EXAMOLITE (C-4D) Designed to produce the very finest simulated daylight. Recommended for critical grading and sorting. COMMERCIAL EXAMOLITE (OR-4D) For use where less critical color evaluation is done and cost is a factor. Recommended for conveyor belt sorting, grading tables, etc.

LABLITE (BBX526) Newest addition to the Macbeth line. Designed for use in setting up color standards and as a master control.



MACBETH-MUNSELL DISK COLORIMETER. Uses the spinning method, and employs Munsell discs of paper color standards for use in grading to U.S.D.A. standards. (Can also be used for setting up your own color standards.)

• For the complete story on "Lighting for Color", as it affects you, send to Dept. FE-9 for Bulletin #271.

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TEMP-R-TAPE®

Questions & Answers

cook 1-1¼ hr. in 165-F. water, or to an internal temperature of 148-152 F.

But don't cook to too high an internal temperature. Otherwise, the liver product takes on a bitter taste.

Now chill the product in cold water, and hang overnight in a cooler.

If you select the right type of ingredients and properly process, liver pudding will turn out firm and yet spread under pressure—hence the name "smearwurst."

Mix-Up Difficulties

Question—Can you offer a way of preventing troublesome mix-ups in our packaging department caused by similarity between containers for different products? We glass-pack a number of items of practically identical appearance. Glass containers are received in printed re-shippers. Recently, we've had several complaints stemming from incorrect naming of products on the case. Apparently, through some error, occasional cases were mixed in a run which carried different printing, and this was not detected on packaging lines.

Answer—Our recommendations must depend on how much you want to spend to insure yourself against this type of complaint. They would also hinge on how often such mix-ups were occurring.

Good starting point would be very careful checking of incoming glass in the printed re-shippers to see whether the mix-ups can be traced to your suppliers handling. If so, and if you are unsuccessful in obtaining cooperation from suppliers, you might consider buying glass in unprinted re-shippers and coding them with your own case-printers.

These printers can be placed right in a packaging line to print, if desired, all four sides. Though fairly costly, they should not only overcome your difficulties, but also substantially reduce shipping-container inventory.

A different approach would be indicated if the mix-up were due to your own handling and if you do not wish to invest in case-printers. We then suggest that you work out a

Q.—How'll I can lima beans with ham?

A.—Formula consists of 20% cured, diced ham (1½-in. chunks) and 40% dry lima beans. Beans are water-soaked an hour at 90F.

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for today and tomorrow

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We shall be happy to help you increase the sales-appeal of existing or contemplated lines through the better use of amply available National Certified Foods Colors. A phone call or note to our nearest office will get immediate, intelligent attention.

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F. J. Tompkins, Chief Design Engineer (right), Bernard Anik, Mechanical Engineer (left rear), Singmaster & Breyer, N. Y. C. Foreground, Michael De Piano, Cooper Alloy Corp.

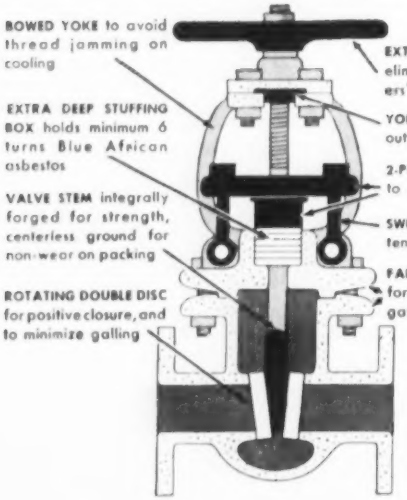
TOMPKINS and ANIK of SINGMASTER & BREYER

tell why they build Cooper Alloy stainless valves into their basic plant designs

Q. Gentlemen, precisely why do you buy Cooper Alloy valves?

FJT—With me, dependability is the main reason. My major concern is overall plant design, and frankly I don't have time to worry about every equipment detail. As specialists in designing and building "first-of-its-kind" processing plants, we need valves we can count on, and can "build in" as part of our original design. Cooper Alloy valves, we've found, fill that bill.

BA—From my point of view as a mechanical engineer, it's the Cooper Alloy valve *design* that appeals to *me*. It has extra features, like the extra-large handwheel, unique square compression of packing, bowed yoke, integrally forged stem, and others, all of which make for less maintenance and longer, more economical valve life.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The Cooper Alloy valve is not an adaptation of earlier brass and iron patterns. Cooper Alloy, with over 35 years of experience in handling stainless steel, created a valve *designed to be cast in stainless!* **Check the Special Design Features shown at left.**

As the little CA man below is saying: *"You can tell a Cooper Alloy Valve as far as you can see it!"* Write today for *your* copy of our folder "Design Factors In Stainless Steel Valves." The Cooper Alloy distributor near you will be glad to show you the complete line of Cooper Alloy valves *and fittings*, and their advantages. He can serve you promptly from local stocks.

COOPER ALLOY

Corporation • Hillside, New Jersey

VALVE & FITTING DIVISION

THIRTY-FIVE YEARS OF STAINLESS STEEL PIONEERING

system of identifying marks on cases, in addition to product name, so that an electric-eye scanner on production line could detect any incorrect cases.

One way to do this would be to have a dark-colored spot on the side of the case, each spot being at a different height for each product. Electric eye (and light source) could then be mounted on vertically adjustable supports, and set for the height of any given spot.

Such a unit might be of the type that is actuated by reduction in reflected light. Thus, each time a case passed with correct identification—spot location, the electric eye would sense it and release a stop to allow it to pass. However, if an incorrectly marked case came along, its spot would not be in position for photo-cell pickup. And the release would not operate.

Equipment cost would not have to be great, and spot-printing on cases probably would not involve any additional cost. Once details were worked out, this system might give you very good protection against future mix-ups.

Choose Metso silicated detergents for thorough grease, oil, protein removal and also for safe cleaning of all equipment. Metso curbs corrosion on tin, aluminum, copper, etc. (Important when detergent mixtures contain corrosive alkalies and synthetics).

Mailed on request "Cleaning in Food Industries"

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DISTRIBUTORS IN OVER 65 CITIES

Hoerner Boxes, Inc.
has been keeping company with
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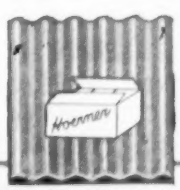
for *9 years . . .*

Dixie Cups in handy home dispensers really cut down the number of extra glasses that have to be washed. And have you noticed that every Dixie Cup you use is uncrushed? Part of the reason for this is that Dixie Cups travel from the plant to the grocer's shelves in Hoerner corrugated containers.

Now, if we may dispense with formalities, we'd like to suggest Hoerner corrugated shipping containers for your product. Call in a Hoerner Packaging Engineer. He can show you how to cut down on extra and unnecessary shipping costs.

Call or write the office or plant nearest you.



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GENERAL OFFICES—*600 Morgan St., Keokuk, Iowa* • **PLANTS**—*Keokuk, Des Moines and Ottumwa, Iowa Sand Springs, Oklahoma • Minneapolis, Minnesota • Fort Worth, Texas • Sioux Falls, South Dakota Fort Smith and Little Rock, Arkansas • Cajas y Empaques Impermeables, S. A., Mexico City D.F., Mexico*

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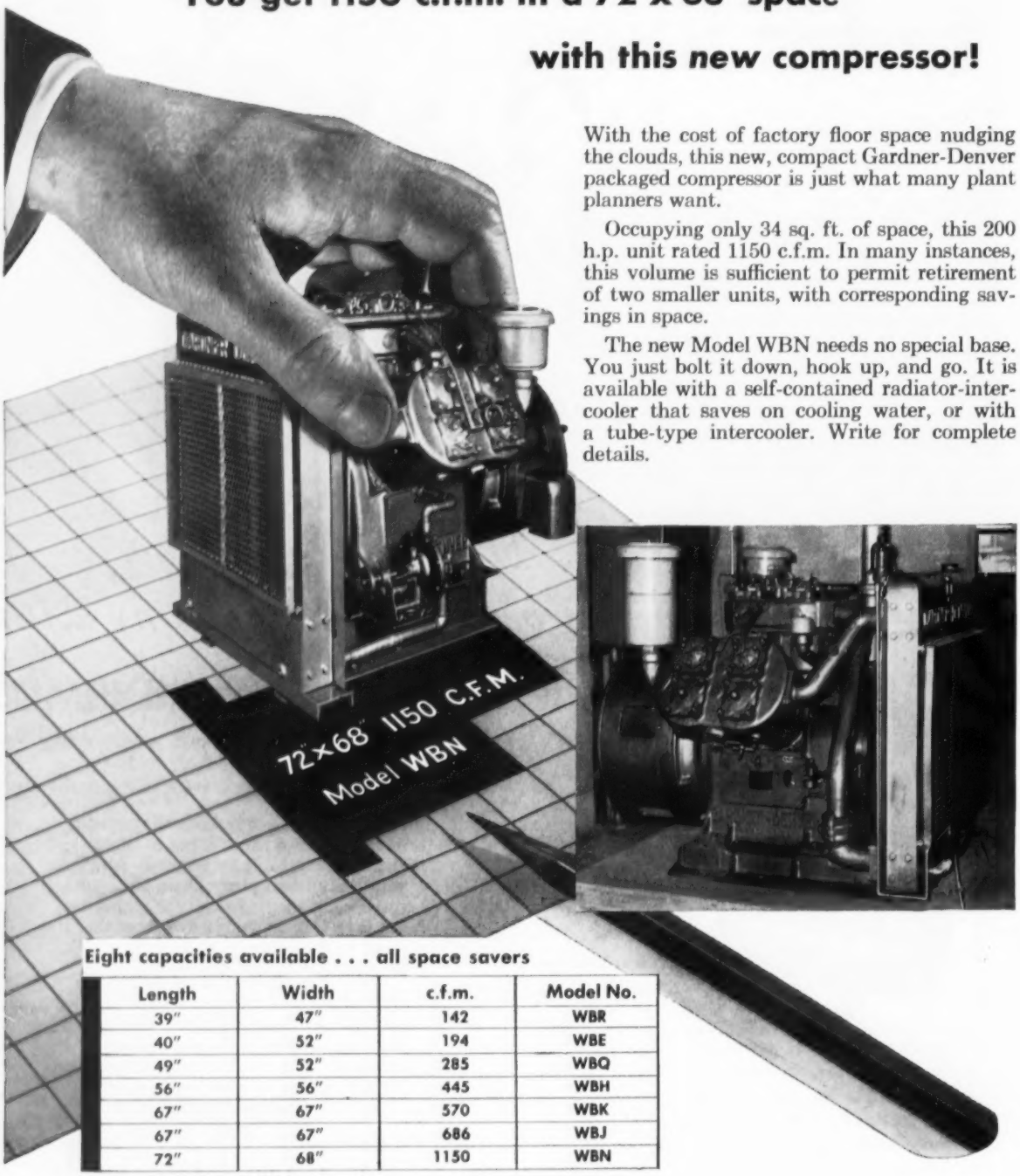
Your own plotting will prove it!

You get 1150 c.f.m. in a 72"x 68" space with this *new* compressor!



With the cost of factory floor space nudging the clouds, this new, compact Gardner-Denver packaged compressor is just what many plant planners want.

Occupying only 34 sq. ft. of space, this 200 h.p. unit rated 1150 c.f.m. In many instances, this volume is sufficient to permit retirement of two smaller units, with corresponding savings in space.

The new Model WBN needs no special base. You just bolt it down, hook up, and go. It is available with a self-contained radiator-intercooler that saves on cooling water, or with a tube-type intercooler. Write for complete details.

Eight capacities available . . . all space savers

Length	Width	c.f.m.	Model No.
39"	47"	142	WBR
40"	52"	194	WBE
49"	52"	285	WBQ
56"	56"	445	WBH
67"	67"	570	WBK
67"	67"	686	WBJ
72"	68"	1150	WBN

ENGINEERING FORESIGHT — PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

"$2,000 is traveling in each of those J&L drums, Hank. How'd the linings look?"

"Everyone's as perfect as the sample we tested. Tell Sales to quit worrying, Dick... we'll get there in perfect shape."

LININGS THAT TALK YOUR LANGUAGE

- J&L specialists, backed up by modern research, are ready to consult on your toughest packaging problems.
- J&L, an integrated steel producer, controls container quality from start to finish.
- J&L steel containers provide engineered packaging for dependable transportation and safe storage.
- Precise fabrication and correct specification of fittings and closures.
- Prompt dependable delivery from nine plants.

Call your nearest J&L Container Division office for recommendations on your packaging problems. Or write direct to the Container Division, 405 Lexington Avenue, New York 17, N. Y.

Jones & Laughlin STEEL ... a great name in steel

For more data, circle this page number on card at back →

Now! A completely new INGREDIENT FOR SOUP MIXES

SnowFlake Instant Milo Starch

8 *ways better for*
CANNED SOUPS AND CREAMED FOODS

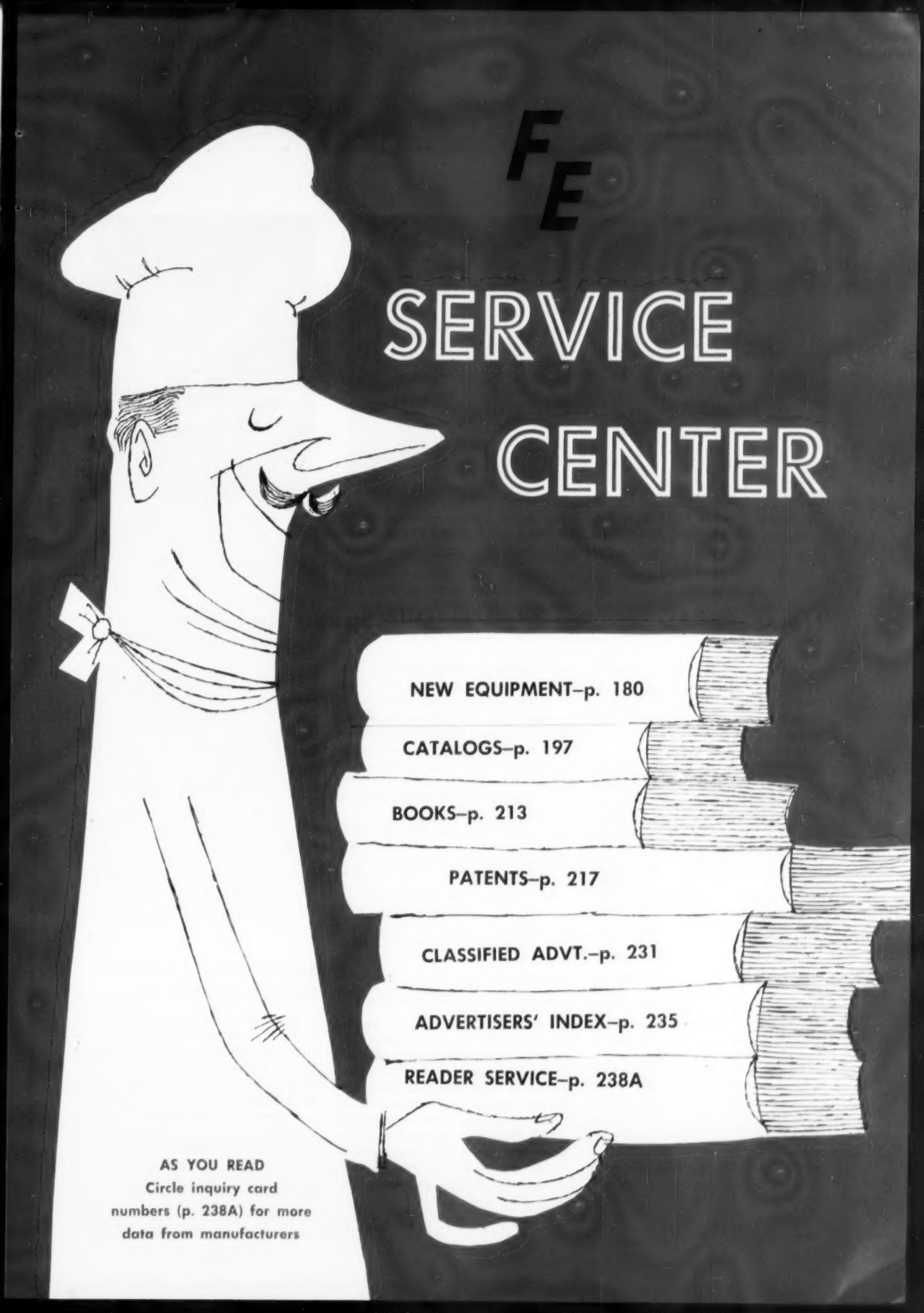
1. Thickens instantly and completely.
2. Assures superlative full-bodied smoothness.
3. Completely pre-cooked under rigidly controlled conditions.
4. Disperses evenly in liquids and solutions.
5. Inherent viscosity control for easier reconstituting of dry mixes.
6. Pure, all-white, flavor-free cereal starch.
7. Fine particles of uniform size—flows freely.
8. Compatible with other food ingredients.

Ideal for use in soup mixes, SNOW FLAKE Instant Milo Starch is more flavor-free, faster-thickening. Because SNOW FLAKE requires less critical measurement of water in reconstituting dry mixes this amazing new starch gives you more leeway in formulation.

Note at left the many advantages offered by new SNOW FLAKE Starch. Write for detailed information. Ask also about technical assistance in adapting this versatile new ingredient to your requirements. Address:

CORN PRODUCTS SALES COMPANY · 17 Battery Place, New York 4, N. Y.

Corn Products also makes these well-known products for the Food Processing Industry: CERELOSE® Brand Dextrose • REX® and GLOBE® Corn Syrups • SNOW FLAKE® Instant Starch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NEW EQUIPMENT & SUPPLIES

COMPACT AND FLEXIBLE gear motors permit efficient operation, simplify maintenance. Left: Integral-type unit employs complete motor, easily removable from gear component. Center: All-motor type, especially useful in continuous operations. Right: Separate reducer may be used with various prime movers.

New Gear Motors Provide Versatile Speed Reduction

To meet today's increasing need for versatile speed reduction, these compact integral-hp. gear motors and related transmissions offer three significant advantages:

1. **Flexibility of mounting.**
2. **Simple speed changes.**
3. **Ease of maintenance and repair.**

The new line has three basic components: An integral-type machine with gear and drive motor packaged into a single unit; an all-motor type that has drive motor coupled to a gear reducer, all mounted on a common carrier; and a separate helical speed reducer, which may be used with various prime movers.

Mounting dimensions on all three components are identical for similar ratings, and parts are interchangeable. This permits maximum stock flexibility in back-up parts and units. Motors are of double-helical-gear design, with housings of corrosion-resistant cast iron.

Equipment's permissible mounting arrangements (without factory alteration) cover the entire range of normal industrial requirements. Extreme mounting positions may be achieved with use of a simple oil level kit, which will be made available.

To simplify ratio changes, the high-speed shaft is bored to take a removable pinion. Latter may easily be removed, in the field, to permit ratio changes by substituting a different pinion and gear set. This change is made in the first-stage gear and pinion only, which adapts the unit to a wide range of speed requirements.

For easy disassembly, the gear housing is completely accessible from either end, and the removable pinion is easily replaced in event of wear. Gear and bearing assemblies are accurately machined to permit reassembly without loss of alignment.

Initially, units will be available in ratings of 1-10 hp. and in three basic types of speed reductions: Single-reduction offset shaft in speeds ranging 780-350 rpm; double-reduction concentric shaft, speeds from 350-37 rpm.; and triple-reduction concentric shaft for output speeds of 30-13.5 rpm.

Integral-type motors will subsequently be offered in 1-30 hp. Separate helical speed reducers and all-motor units will be available in sizes ranging 1-75 hp.—*General Electric Co., Gear Motor & Transmission Dept., Paterson, N. J.*

Circle 180A on Reader Service Card

Want More Information?

It's free — and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service Postcard — back of book. Then sign at the bottom and mail. For your convenience, too, these items are listed and keyed in the Reader Service Section.

Special Synthetic Rubber Ups Conveyor-Belt Life

Superior resistance to animal fats and vegetable oils is cited for new conveyor belting employing a special type of synthetic rubber. Product remains pliable at −40F., and maintains dimensional stability at 250F.

Known as Globe Hycar, it has a $\frac{1}{16}$-in. top cover of rubber and a specially woven carcass of lightweight duck. Latter is calendered with rubber for maximum pliability and re-

sistance to cracking. A friction bottom surface provides operational efficiency.

Odorless, non-toxic, and non-porous, belting is available in white for conveying, in cut widths ranging to 48 in. (2-5 ply). It is also offered in vision-aiding green (3-ply) for inspection tables.—*Globe Woven Belting Co., 1400 Clinton St., Buffalo, N. Y.*

Circle 180B on Reader Service Card

3 Telescoping Uprights Boost Unit's Versatility

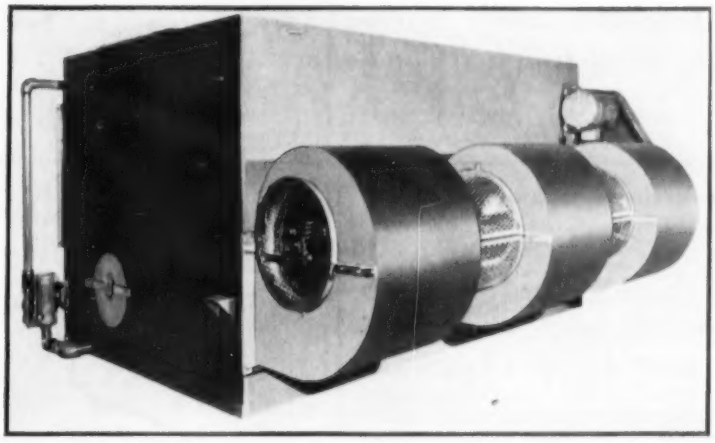
Here's a new fork truck with telescoping uprights that raise to permit ceiling-high stacking, yet retract sufficiently to pass through low doors.

Called "Triple Lift Upright," it employs three sets of channels. Two inner rails and two intermediate I-beam sections are nested in two outer channels. This assembly is locked against shock dislocation.

Trucks are available in capacities of 3,000, 4,000 and 5,000 lb. Maximum fork heights range 10½-18 ft., free lifts: 15-23 in. With forks lowered, overall height is only 65 in.

Twelve rollers, manually adjustable for wear, absorb both radial and thrust loads, also prevent high-load sway.—*Clark Equipment Co., 1921 Escote St., Battle Creek, Mich.*

Circle 181A on Reader Service Card



New Condenser Line Provides Low-Cost Operation

Efficient performance is coupled with low maintenance in this new line of evaporative condensers. Designed primarily for outdoor service with Freon or ammonia, they can, however, be modified for indoor use as well.

Called VXF, units are available in capacities of 30-300 nominal tons. Since fans are externally mounted, they do not handle moist saturated air from the spray chamber. This minimizes corrosion, facilitates servicing of fans and bearings, and greatly extends fan life.

Condensers employ prime-surface condensing coils, which provide efficient heat-transfer and are easily cleaned. Coils (hot-dipped galvanized) are pitched to speed gravity-flow of condensed refrigerant, staggered for complete surface wetting, and spread to reduce air-pressure drop. Thus, power requirements are cut and noise level is minimized.

Unit's ⅞ in. sheet-steel casing is made without panels, which eliminates the problem of leaking bolts, screws, or joints. Sliding eliminators and a manhole cover provide easy access to sprays and other interior components.

Also offered is another new line of condensers (VSC) primarily for indoor use, although they can be installed outdoors.

These units are of the sectional-frame type and can be dismantled into three sections for easy indoor placement and simplified erection. They are readily adaptable to duct work and room ventilation. Suitable for either Freon or ammonia, they have prime-surface condensing coils of ¾-in. schedule 40-steel pipe.

Capacities range from 50-300 nominal tons.—*Vilter Mfg. Co., 2223 S. First St., Milwaukee.*

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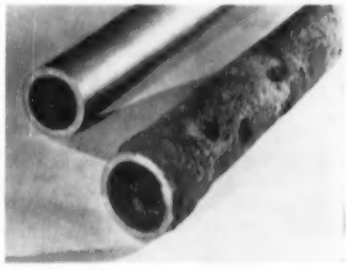


Ferrous Metals Protected By New Coating Process

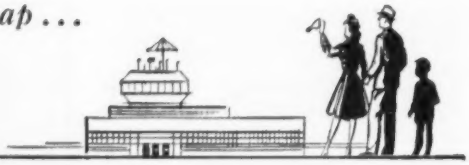
Corrosion and wear resistance of ferrous metals may be greatly increased by a new method of applying protective nickel-alloy coatings. Photo shows two identical 1½-in. pipes (alloy-clad at left, the other untreated) after identical periods of service in a heating-coil system.

In this process (Niphos), coatings are easily applied to iron pipe, sheet, conveyors, and machine parts. After application, units are heated in a re-

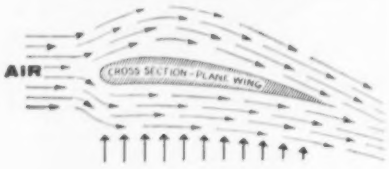
CUT OUT AND FILE

HOW THIS MODERN STEAM TRAP UTILIZES PRINCIPLE OF AIRPLANE LIFT!

New application of an old principle produces totally different type of steam trap ... of great simplicity and effectiveness



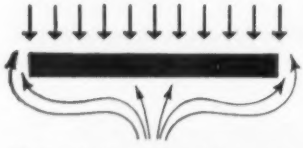
THIS GIVES AN AIRPLANE LIFT



Greater speed of air over curved upper wing surface creates lower pressure over this area (Bernoulli's Law) ... resulting in **lifting** force.

THIS SAME PRINCIPLE USED TO CLOSE SARCO TD STEAM TRAP VALVE

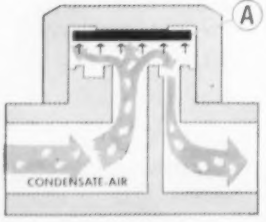
Valve is a simple hardened stainless steel disc.



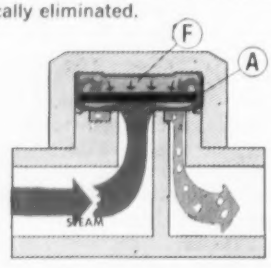
High velocity steam jet across bottom of valve disc creates low pressure area — resulting in **downward** force.

ONLY SARCO TD USES THIS UNIQUE OPERATING PRINCIPLE

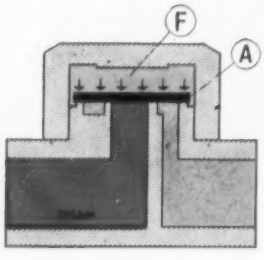
Result: Extreme simplicity—no valve mechanism—maintenance practically eliminated.



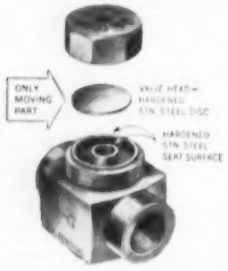
1. Inlet pressure raises disc "A" from seat ... immediate discharge of air and condensate at steam temperature.



2. Steam follows condensate and the high velocity jet across bottom of disc "A" creates low pressure area (Bernoulli effect) ... jet is deflected into chamber "F" where it builds up pressure by re-compression and this pressure acts on top of disc "A" ...



3. Pressure in chamber "F", acting on full top area of disc "A", exceeds force of incoming steam and low pressure area under disc ... and immediately forces it down, closing inlet. As condensation decreases pressure in chamber "F", disc rises and steps 1 or 2 repeat.



Small size ... large capacity

Only 3 parts ... all stainless steel. Sizes ⅛ to 1"—each body is as small as a tee fitting! Capacity is determined not by a bulky body but by the effective orifice, valve action, pressure drop and condensate temperature.

A few of many advantages

* *Practically no maintenance*—no valve mechanism, no narrow channels. Trouble-free, simple design.

* *Cuts trap inventory*—one large capacity seat for all pressures ... for heavy, light, or no condensate load.

* *Self-adjusting for pressures 10 to 600 psi*—not a single change or adjustment required.

* *Operates perfectly when pressure fluctuates*—throughout full pressure range.

SEE FOR YOURSELF

We will gladly send you a Sarco TD Steam Trap and strainer for 60-day trial. No cost or obligation. Advise size —⅜, ½, ¾ or 1"—and application. Sarco Company, Inc., Empire State Bldg., New York City.

2204-C

SARCO Thermo-Dynamic STEAM TRAP

THE MODERN TRAP THAT IS MAKING STEAM TRAPPING HISTORY!

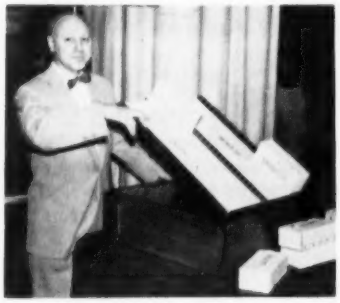
ducing atmosphere. Result is a tight-adhering cladding which will not peel or flake even when subjected to a 180-deg. bend.

Furthermore, the alloy can be applied locally to areas to be joined by brazing. Coated surfaces are merely placed in contact and heated.

Average coatings, applied primarily for corrosion protection, are about 0.001 in. thick, but finishes up to 0.025 in. can be attained in one application. This thickness can be further increased by repeated applications to resurface or build up worn base-metal areas.

Coatings prevent scaling of base metal at temperatures to 1150F., and properly welded coated surfaces suffer no loss of corrosion protection in the weld area.—*Tube Reducing Corp., Wallington, N. J.*

Circle 181C on Reader Service Card



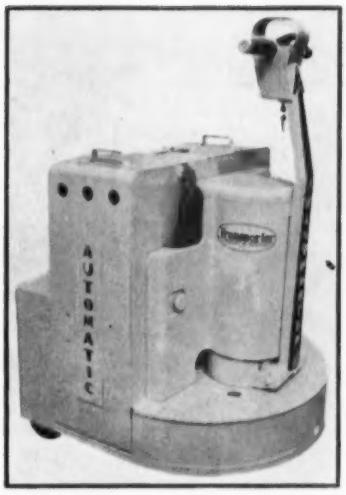
Carton's Anti-Skid Flaps Permit Safer Stacking

Flap surfaces of the container at the top of this 32-deg. incline have been chemically treated to produce a high-friction surface, thus the box does not slide.

Known as Load-Lok, unit is designed for maximum anti-skid properties when two such treated surfaces are in contact. This permits better stacking of loads and reduces danger of shifting in pallatized handling.

The chemical treatment does not interfere with carton sealing, either by taping or gluing, and flaps can be printed or stenciled. And these boxes may be handled without danger of abrasion or irritation to hands.—*Stone Container Corp., 4200 W. 42nd Pl., Chicago.*

Circle 183A on Reader Service Card



New Operator-Led Truck Is Compact, Maneuverable

Accenting the trend toward shorter operator-led industrial trucks, this highly maneuverable unit is only 35¼ in. long.

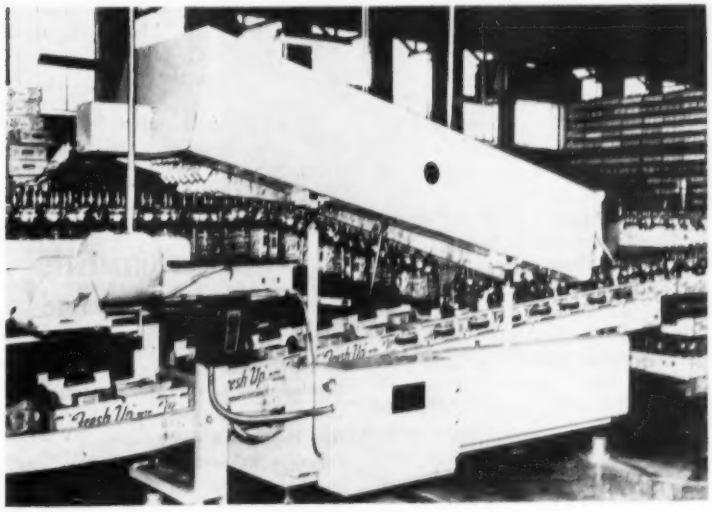
Included in a new line are two models specially designed for compactness, yet readily accessible for service: Model WT-2A with 200-lb. draw bar pull has an ultimate of 700 lb.; and Model WT-4A has normal draw bar pull of 400 lb., with an ultimate of 700 lb. Trucks' shorter length, attributed to use of a new all-gear power unit, enables making a U-turn in a 4-ft. aisle.—*Automatic Transportation Co., 149 W. 87th St., Chicago.*

Circle 183B on Reader Service Card

Continuous Density Control Offered by In-Stream Unit

Density of continuously flowing liquids may be read directly from a new precision instrument that permits zero-set adjustment and temperature compensation.

Known as Princo No. 745, models are available with ranges from 0.01-0.50 units. They may be used at temperatures to 220C., pressures to 125 psi. Components include: Pyrex-pipe body; inlet and outlet fittings of 316 stainless or Hastelloy B or C;



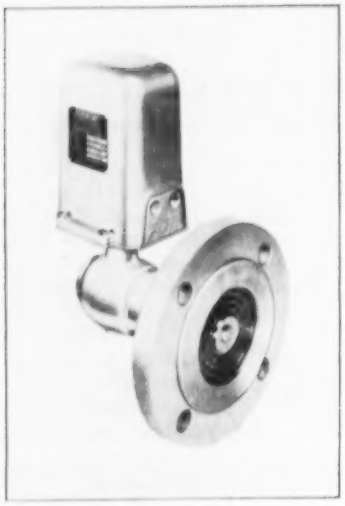
500-Per-Min. Uncaser Simplifies Bottle Transfer

Providing work-level infeed, this automatic half-depth uncaser (Model 7-U) saves valuable floor space and eliminates need for crest-type conveyors. Furthermore it's quickly adjusted to handle bottles ranging 6-32 oz., in 3- and 4-wide cases. Unit's overhead gripping fingers gently ease bottles from case-carrying conveyor (entering at right), deposit them on upper belt leading to washer.—*Radio Corporation of America, Industrial Products Div., Camden, N. J.*

Circle 183C on Reader Service Card

Pyrex plummet; calibrating chain (platinum or tantalum); standard connections, ½ in. NPT female; and bi-metallic dial thermometer.—*Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia.*

Circle 183D on Reader Service Card



Accurately Gages Level of Viscous Liquids

Offering simple means for gaging the level of viscous liquids in open or closed tanks, this differential-pressure transmitter mounts directly on the side of a vessel.

Known as Type 13 FA, it operates on the force-balance principle and maintains calibrated accuracy over a wide range of ambient conditions.

Level-measuring element is a silicone-filled diaphragm capsule assembled in a 3-in. flange. Head of liquid in tank applies force to its high-pressure side, which is opposed by force on the low-pressure side. Latter may be opened to atmosphere for measuring open tanks, or may be connected to the top of a closed tank to balance out the effect of static pressure.

Unit's pneumatic output, a 3-15 psi. signal proportional to tank level, will operate a remote indicator, recorder, or controller without use of a signal amplifier.—*The Foxboro Co., Foxboro, Mass.*

Circle 184A on Reader Service Card

Large-Package Checkweigher Is Highly Accurate

With this conveyor-line unit, large packages may be checkweighed in ½ sec. with an accuracy of 1 part per 1,000.

Available in standard capacities of 50 and 100 lb., these machines (Checkweighers) can, furthermore, be modified for these three specific applications:

1. "Over-under-and-on" indication, using panel-mounted tolerance controls.
2. Counting of over-, under-, and correct-weight packages.
3. Handling weight data in tabulated or digital form.

An auxiliary electrical output signal from the scale can also be used to actuate automatic conveyors for rejecting short-weight packages, marking packages, or stopping the conveyor line.

In the illustrated unit, all weight settings from ¼ to full-scale capacity are made by adjusting dials on the tamper-proof control panel. No internal adjustment of the scale mechanism is required.

An audio-visual system is used with a green light indicating correct weight, and a red light and chime arrangement for either underweight or overweight. This indication unit may be mounted at any convenient point external to the scale, or built into the case.

An adjustable weight allowance accommodates normal variation in container weight, the tolerance ranging 0-1% of applied load.

Unit's case dimensions are 18x 29½x8¾ in.; platform is a conveyor section 18x30x12 in. with eight 2-in.-dia. aluminum rollers on 4-in. centers.—*Triner Scale & Mfg. Co., 2716 W. 21st St., Chicago.*

Circle 184B on Reader Service Card

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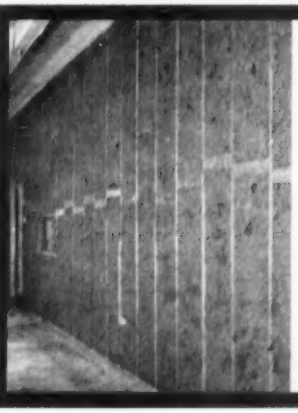
Big super market chain switches to Void Free PALCO WOOL

This Tustin, California unit is one of approximately 10 huge Market Basket Stores recently completed, in construction or planned for the near future—each with 7 freezer and cooler rooms insulated with Void Free *Palco Wool*.

Palco Wool is packed behind temporary retainer sheets which are moved up as fill progresses, leaving entire wall open for inspection to eliminate any possibility of voids.



Resilient, self-supporting *Palco Wool* remains in place throughout entire wall, allowing full inspection before interior finish is applied. This is one of 7 cooler and freezer rooms at the Market Basket in Tustin, Calif.

5 newest markets and 5 more scheduled with Void Free PALCO WOOL Insulation in over 70 large freezer and cooler rooms

Recognized among the largest, most modern de luxe super markets in the nation, 38 Market Basket Stores have gained wide experience with many types of low temperature insulation. In all of their recent and planned installations, Market Basket now specifies *Void Free* PALCO WOOL—the Underwriters' Laboratories labelled insulation that combines all these advantages:

- No cracks
- No joints
- No convection loss
- No pockets
- No settlement
- No trapped moisture
- No shrinkage
- No leaks
- No deterioration

Send now for this helpful detail material ➡

THE PACIFIC LUMBER COMPANY

PALCO INSULATION WOOL ®

100 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA

THE PACIFIC LUMBER COMPANY

Room No. 2404 701R
100 Bush Street, San Francisco 4, California

Please send me, without obligation:

- ☐ New complete Refrigeration Insulation Manual
- ☐ Sample of *Palco Wool* Insulation
- ☐ In-place test data on insulated structures

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

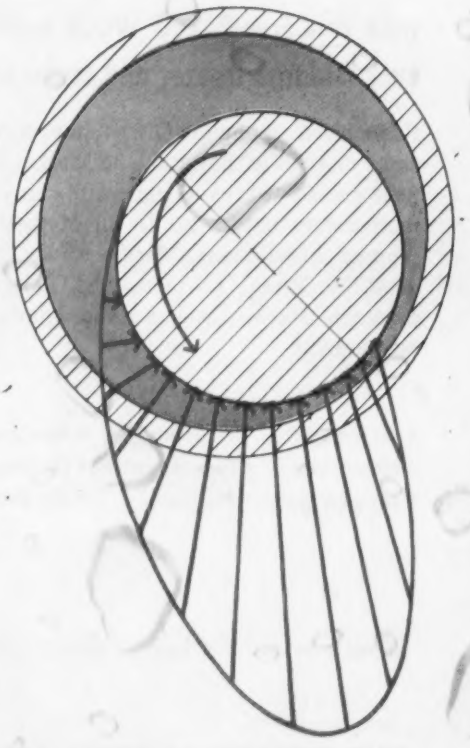
For more data, circle this page number on card at back ➡

DO YOU USE STEAM, WATER OR ANY LIQUID IN YOUR PROCESS?

Then you may need

STANOIL Industrial Oil

Plants with wet processing have a real lubrication problem when steam, water or liquids from the processing operation enter the lubrication system. Many lubricating oils emulsify when agitated with water, especially when there is a small amount of dirt present. With water in the oil, there is the chance that no oil film exists between metal surfaces. Result: wear, corrosion, equipment failure. The chance of this happening is eliminated when you use STANOIL Industrial Oil.



By special refining techniques, STANOIL Industrial Oil is made resistant to emulsification. No matter how tight the lubrication system, some water will always be present either through seepage or through condensation. STANOIL resists the tendency of this water to mix with the oil. Instead, STANOIL separates out and continues to perform its job of lubricating bearings and other moving metal parts. In addition, STANOIL minimizes air entrapment with a special defoamer additive.

This is just one way in which STANOIL Industrial Oil can help you get superior lubrication of equipment. STANOIL has unusually high stability, gives longer oil life, minimizes carbon deposits and wear of equipment. A special rust inhibitor prevents rust and corrosion by "plating out" on metal surfaces.

STANOIL's low pour point assures a free-flowing lubricant in cold service and at start up.

STANOIL has a high viscosity index, resists viscosity change over a wide temperature range. The low carbon-forming tendency of STANOIL means low-cost operation and long-service life of equipment.

Get the facts about STANOIL Industrial Oil from the Standard Oil office near you in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

Lubrication trouble spots
where STANOIL Industrial Oil can serve you

- **Washing equipment**
- **Agitators**
- **Conveyor drives**
- **Air compressors**
- **Speed reducers**
- **Lift trucks**
- **Electric motors**
- **Auxiliary turbines**

STANDARD OIL COMPANY
(Indiana)

STANDARD

New Design Boosts Power Of Plate-Magnet Line

A 2½-fold increase in separating efficiency is reported for new plate magnets specially designed to remove tramp iron from flowing materials.

Unit (Magman) employs an offset air gap to take full advantage of the magnetic strength of Alnico V. Thus, magnetic force is concentrated directly over the first pole piece, which prevents escape of particles due to acceleration.

Units are offered in three sizes (Series 100, 200, and 300) according to strength of pull, and in widths from 6-48 in.—*Stearns Magnetic Products, 635 S. 28th St., Milwaukee.*

Circle 187A on Reader Service Card

Accurate Weigh-Bagger Speeds Pre-Packaging

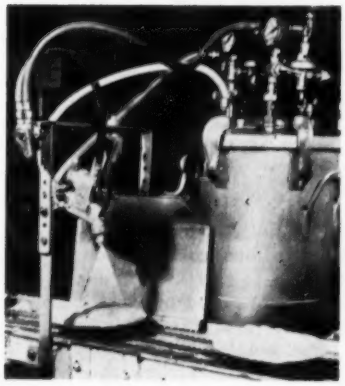
This automatic weigh-bagger reportedly provides fast pre-packaging of almost any kind of produce—into any type of bag—without use of adapters.

A continuous-flow unit (Rollaweigh) with capacity up to 15 lbs., its interchangeable counterweights permit 30-sec. changeover. Machine employs a scale-mounted conveyor.

In operation, produce is loaded into an open hopper (photo at right). From there, it is gently elevated by a rubber belt having rubber flights for singulated accurate feed. Product then drops onto a short conveyor that travels across the weigh platter. Feeding is automatically cut off as correct weight is reached.

Item is packaged as operator positions a bag and depresses a delivery scoop. Cycle repeats when scoop is released.—*Exact Weight Scale Co., 944 W. Fifth Ave., Columbus, Ohio.*

Circle 187C on Reader Service Card



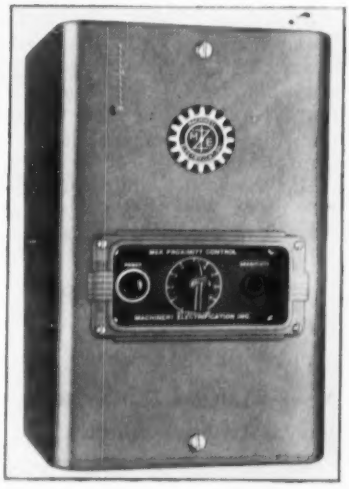
Bakery Production Sped By Sanitary Spray Gun

Toppings and glazes for baked goods, and coatings for pans, may now be quickly and accurately applied by a new sanitary spray gun.

Furthermore, this technique eliminates the possibility of stray brush bristles contaminating the toppings. And old pastry cannot be carried back into the fresh wash.

Known as San-Rod, unit may easily be operated manually or automatically. It can be triggered by electrical impulses or compressed air. Gun is disassembled without tools and its smooth internal surfaces and straight channels permit easy cleaning.—*Eclipse Air Brush Co., 391 Park Ave., Newark, N. J.*

Circle 187B on Reader Service Card

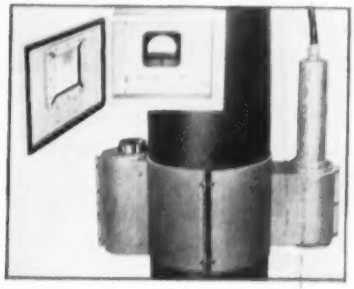


Many Applications Cited For Proximity Control

This electronic proximity control detects the presence of insulators or conductors without contacting their surfaces.

Known as MEK-3030, it can be used as a limit switch, as a level control, or as an interface control between two dissimilar fluids. Unit operates on high-frequency energy. Presence of a material close to the detecting element is indicated by an increase in loading, which is detected and amplified to operate a relay.—*Machinery Electrification, Inc., Northboro, Mass.*

Circle 187D on Reader Service Card



Unit Gages Liquid Density By Radioactivity Method

Density, specific gravity, or percent solids of a flowing liquid may now be simply and accurately gaged

with a new radioactivity pipeline unit.

Known as Model LSG, it may be used on pipes of 3-in. dia. and larger. On a 10-in.-dia. line, the instrument's span is 0.2 with a precision of ±0.004.

All measuring components are located externally, thus operation is not adversely affected by temperature, pressure, viscosity, corrosion, or abrasion. Safety is insured by a lead-shielding holder for the radioactive source (left of pipe in photo) and lead-laminated brackets. Attached at right is a single-tube amplifier mounted over a measuring cell. The inset shows the power supply unit (110 v., 60 cycle, a.c.) with gasketed door opening.

Absence of moving parts in the measuring unit minimizes maintenance, and installation is termed simple.—*Ohmart Corp., 2236 Bogen St., Cincinnati.*

Circle 187E on Reader Service Card

Unit's New Polishing Roll Gives High-Gloss Finish

Speedier high-gloss machine polishing of floors is reported with use of a new 21-in. pile fiber cylinder (upper left in photo).

Mounted on maker's vacuum unit (Model E), this thickly cushioned element eliminates rings and circular swirl marks. It is especially recommended for lightly soiled corridors and offices.

Revolving rapidly inside a vacuum hood, cylinder's ⅝-in. nap strands instantly suck light soil into a fabric bag. A thick sponge-rubber base permits good surface contact, even on irregular floors.

Unit is self-propelled, weighs 95 lb., and has a 1-hp motor. Cylindrical accessories include polishing and scrubbing brushes and steel-wool rolls.

In addition, a special built-in wax bar provides for one operation removal of floor wax.—*G. H. Tennant Co., 721 N. Lilac Dr., Minneapolis.*

Circle 188A on Reader Service Card

INGREDIENTS

Blend of Liquid Sugars Offers Many Benefits

A new liquid sugar—corn syrup product, refinery processed to yield a 70-deg. Brix blend, now saves the processor the time, expense, and possible error of batch mixing. Furthermore, this uniform syrup eliminates need for two separate tank and pump systems.

Known as "Comogenized" Flo-Sweet, it consists of 80% industrial sucrose solids and 20% corn-syrup solids. Product will not separate or stratify in transit, storage, or final use, which prevents fluctuations in flavor and texture.

At present, the syrup is available only in the New York City area.—*Refined Syrups & Sugars, Inc., Yonkers, N. Y.*

Circle 188B on Reader Service Card

New Seafood Tenderizer Has Own Seasonings

Now available to seafood processors is a ready-to-use tenderizing solution containing spice essential oils and a small proportion of sodium benzoate.

Called Spisorama, it is designed for use prior to quick-freezing or cooking. Product should be completely immersed in the re-usable solution for 30 sec., then processed immediately to prevent excessive tissue breakdown.

The tenderizer is also offered in unseasoned form.—*Dodge & Olcott, Inc., 180 Varick St., New York City.*

Circle 188C on Reader Service Card

BHA in Tablet Form Is Easier to Use

Butylated hydroxyanisole, widely used as an antioxidant for fats and oils, is now offered as free-flowing tablets for easier handling and dissolving.

Designated Sustane BHA, tablets are packaged in 5-lb. sanitary, hermetically sealed cans that guard against contamination.—*Universal Oil Products Co., 30 Algonquin Rd., Des Plaines, Ill.*

Circle 188E on Reader Service Card

CHEMICALS

Solid-Form Antifoams Save Storage Space

Convenience and economy are advantages cited for a new line of 'instant' antifoams.

Available in flake or powder form, these concentrated products (Series HC-300) are merely added to water —½-1% is an average concentration. They emulsify immediately and are ready for use. Materials are packaged in exact quantities required for a given concentration, which simplifies preparation.

Shipped without diluent, agents offer savings in freight charges and storage space. For example, 25 lb. of product reportedly is equivalent to ten 55-gal. drums of liquid antifoam. —*Hodag Chemical Corp., 7247 N. Central Park, Chicago.*

Circle 188D on Reader Service Card

Water-Base Coating Seals Masonry, Plaster Walls

Formulated with polyvinyl chloride resins, this new water-base coating offers lasting protection for walls and ceilings in food plants.

Known as Amercoat No. 88, it resists chemical attack and seals

UP IN PERFORMANCE—

down IN SIZE!

Clayton STEAM GENERATORS

SAME HORSEPOWER IN AS LITTLE AS 1/4 THE SPACE!

Completely automatic in operation, Clayton generators give you more horsepower in less space than other generators. They're up to 400% more efficient; foot for foot and pound for pound they give you four times the horsepower of boilers with ordinary thermal circulation because of Clayton's exclusive mechanical control of every phase of steam generation.

SO IS THE CLAYTON TO THE ORDINARY STEAM GENERATOR

RELEASES SPACE FOR PRODUCTION USE—

The Clayton "package" steam generator is a complete unit, integrally mounted on rigid welded steel self supporting frame, ready for easy installation and immediate use. No need to remove walls. Rigging and transportation costs are reduced and there are no extras to buy. Models from 15 to 100 HP require only 15 to 28 sq. ft. of floor.

SO LIGHT, SO COMPACT—SPOT THEM ANYWHERE—

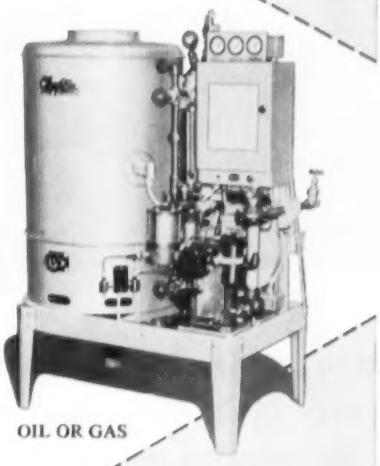
Years-ahead design and higher thermal efficiency make Clayton steam generators so compact they can be installed anywhere, on roof, basement or where-ever there is a need for steam. Special foundations unnecessary since floor loading is no problem. It's far more efficient to install several Clayton steam generators than to depend upon a single, outmoded central boiler.

ADDED STEAM FOR MORE PRODUCTION—QUICKLY—CONTROLLED

steam generation is the secret of Clayton efficiency. Advanced design gives you higher efficiency throughout overall operating range, provides full horsepower from a cold start within 3 minutes, yet reduces fuel cost as much as 50%. And it automatically adjusts to steam load requirements. Servicing is easy and operation is clean.

THEY LAST LONGER TOO!

Of every 100 Clayton generators produced (in the last 26 years), 97 are still serving users profitably and efficiently.



OIL OR GAS

Exclusive!

Compare Clayton's 5-year published coil warranty covering material and labor.

F-9

Clayton MANUFACTURING COMPANY EL MONTE, CALIF.

Clayton Manufacturing Company
P.O. Box 550, El Monte, California

Gentlemen:
Please send us the complete details about Clayton Steam Generators and how we can save floor space and increase our steam production.

Name _____

Company _____

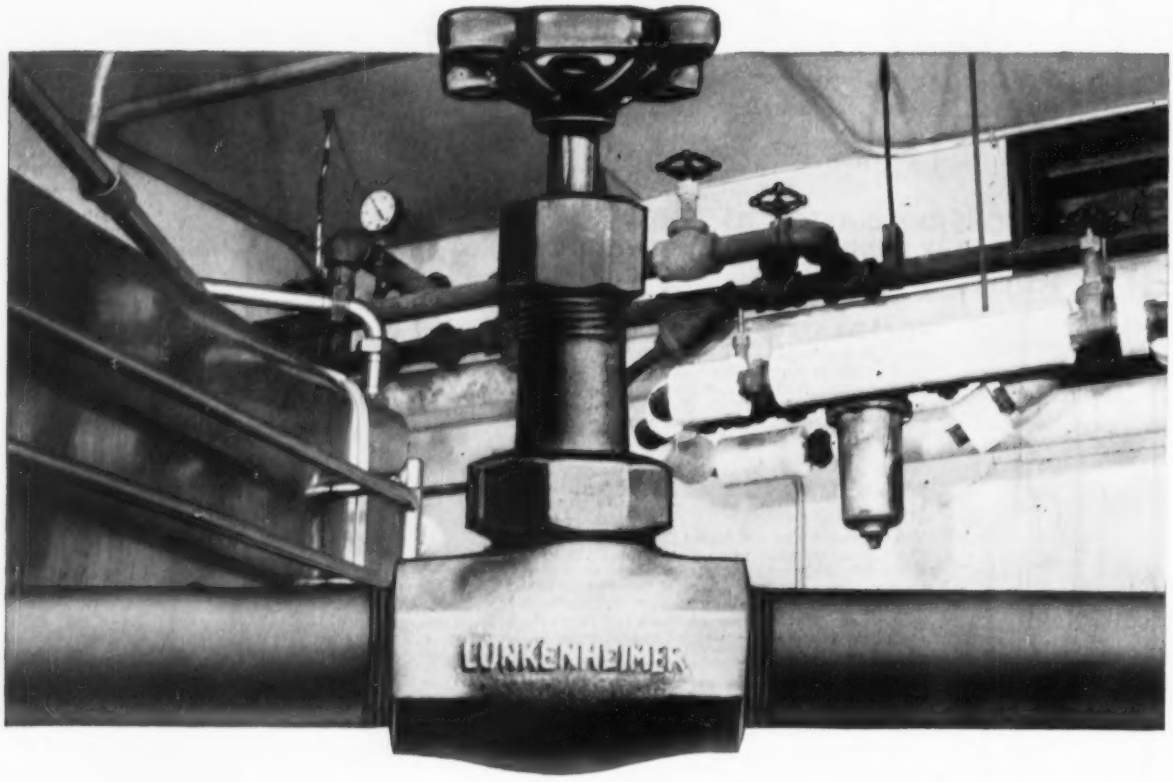
Address _____

City _____ **Zone** _____ **State** _____

We use steam for _____

For more data, circle this page number on card at back →

ONE ANSWER
to spiraling maintenance costs



LQ600—The Most Maintenance-Free Bronze Globe Valve Ever Developed!

The moment a maintenance man touches a wrench to a valve, its cost can double. You can't bring down that labor expense in many plants, but you can buy valves with an outstanding record of trouble-free service. At no time in history has valve quality been so important to your total plant expense. And quality has been a tradition for nearly a hundred years at The Lunkenheimer Company, Box 360, Annex Station, Cincinnati 14, Ohio.

See your cost-reducing Lunkenheimer distributor . . . or write for literature.

BRONZE • IRON • STEEL • PVC

The cost of a LUNKENHEIMER VALVE
Gets smaller...and smaller...and smaller...
with each passing year of dependable service

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LUNKENHEIMER QUALITY

LUNKENHEIMER®
THE ONE *Great* NAME IN VALVES

plaster and masonry against water vapor. Coating is easily applied by brush, spray, or roller, and air dries in 2-4 hr. to an attractive semi-gloss finish. Product is odorless, nontoxic, non-flammable, and unharmed by repeated scrubbing with detergents.

Material is available in 12 pastel colors.—*Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.*

Circle 188F on Reader Service Card

Efficient Cleaner Signals Dirt-Saturation Point

Developed especially for manual cleaning is a new detergency-indicating product consisting of mild alkalis, synthetic detergents, and water conditioners.

Known as Pinnacle, it permits efficient washing of stainless-steel ware, equipment, floors, and walls. However, it is not recommended for machine use or for soaking of aluminum ware.

Product dissolves quickly in water, forming a bright green solution that turns dull green when dirt-saturation point has been reached. Conditioners prevent hard-water mineral deposits and dissolve old film.

Material is available in 4-lb foil-wrapped packages, also 100- and 325-lb. moisture-proof drums.—*Calgon Co., Commercial Detergents Dept., Hagan Bldg., Pittsburgh.*

Circle 191A on Reader Service Card

BRIEFS . . .

Automatic Net Weigher enables accurate filling where overhead clearance is limited. Unit (Model 447-22-NW) employs air-operated slide valve that mounts directly on storage hopper, even-balance lever system with visual indicator and dial, controller, and remote-control station. Machine can also be set for semi-automatic or manual operations.—*Exact Weight Scale Co., 944 W. Fifth Ave., Columbus, Ohio.* (191A)

Automatic Starch Duster for use with bread and roll makeup equipment has integral collector, which eliminates double handling of recovered starch. Unit (Pneuma-Flo) provides 120 sq. ft. of cloth filter surface for efficient separation. — *Pneuma-Flo Systems, Inc., 141 W. 20th St., New York City.* (191B)

Stainless Reciprocating Pump offers product protection and low maintenance costs. Unit operates on 30-200 psi. air supply, discharges 1-20 gpm. at 1½ times incoming air pressure. Liquid temperatures may range −30 to 220F.—*Balcrank Inc., Disney St., Cincinnati.* (191C)

Power-Driven Coder handles all sizes of cottage-cheese containers. Device (Kiwi) code-dates the bottom of carton and prices the top in one pass. No change parts are required.—*Kiwi Coders Corp., 3804 N. Clark St., Chicago.* (191D)

Nylon Ball Brushes, pumped through CIP lines (along with detergent solution), speed removal of milk stone and other foreign matter. Available in 3 sizes from 1¼-3½ in. o.d.—*Braun Brush Co., Woodhaven, N. Y.* (191E)

Versatile Color Printer applies variable data simultaneously at three different levels in package printing and labeling. Unit (Cosomatic) handles items of plastic, metal, wood, glass, or paper at speeds up to 8,000 per hr.—*Cosom Engineering Corp., 6012 Wayzata Blvd., Minneapolis.* (191F)

Maintenance-Shop Unit combines shearing, punching, notching, and coping. Machine shears flat, round, and square bars, steel angles, and steel plate. Also punches holes up to ⅞-in. dia. in ¼-in. plate.—*Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago.* (191G)

Motor-Overload Control with adjustable limits provides continual indication. Employing 'fail-safe' circuitry, accurate device (Load Sentry) sounds an alarm and/or shuts down a motor when maximum selected load is reached.—*Assembly Products Inc., 7 Bell St., Chesterfield, Ohio.* (191H)

Centrifugal-Pump Line, employing a diagonally-split casing, is termed well suited to boiler-feed service, also handling of hot or volatile liquids where low NPSH is required. The 45-deg. split allows both suction and discharge to be in bottom half of casing, yet above center line of pump.—*New York Air Brake Co., Aurora Pump Div., Aurora, Ill.* (191I)

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presents

an outstanding improvement in

DIAL THERMOMETERS

external calibration

Full 3½" Dial Face

- No Sector
- No Pinion
- No Linkage
- Constant Accuracy
- Easy Readability

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THERMOMETERS, INC.

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Mfrs. of Industrial Laboratory Recording and Dial Thermometers

Bulk-Sugar Delivery Sped by Tilting Dump Trailer

Faster unloading of granulated sugar at New England candy plants is being achieved by this dump-trailer unit, newest addition to the fleet operated by Revere Sugar Refining Co., Boston.

Unit comprises a 157-in.-wheelbase tractor (Model V-225, International Harvester Co., 180 N. Michigan Ave., Chicago) and a 24-ft. insulated stainless semi-trailer (capacity 34,000 lb.) Gross combination weight is 58,000 lb., the high cargo capacity enabled by the long wheelbase.

For rapid unloading, a single-piston telescopic hoist raises the 18-ft. tank body 50 deg.

Circle 192A on Reader Service Card

Pneumatic Conveying Cuts Coffee-Processing Costs

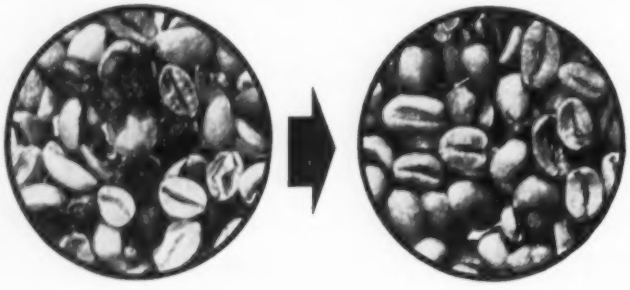
Air conveying of green coffee beans from storage to a processing plant across the street has proved a two-fold benefit at J. F. G. Coffee Co., Knoxville, Tenn.

First, handling costs were cut 50% by eliminating inefficient manual operations. And valuable processing space, which was taken up by bag storage, was reclaimed—a further saving.

Employed in the new system (Airstream Conveyor, Dracco Corp., 4063 E. 116 St., Cleveland) is an elevated 150-ft. pipeline, 4½ in. dia. In operation, beans enter the pneumatic line from a 10,000-lb. bin equipped with a special hopper. From the warehouse, they travel across the street and up to a roof-top receiver.

Here, beans are separated from conveying air and discharged to a screw conveyor leading to storage bins and roasters.

Circle 192B on Reader Service Card



Unretouched photographs of a typical coffee bean upgrading with standard Sutton equipment.

Picture of a man making money . . . . .

The upgrading and classifying of coffee beans is only one of hundreds of different Sutton equipment applications. However, all have one factor in common. *More profit for the processor.*

Specifically, here's what *dry separation by fluidization* can do. With an extremely accurate removal of contaminations *(both magnetic and non-magnetic)* you automatically control quality through increased purity, decrease wear and tear on equipment, and minimize hand-picking costs.

There's a lot more to tell about Sutton Gravity Separators and Stoners. May we?

FOR ADDITIONAL INFORMATION ON VARIOUS MODELS AND OPERATING DATA, WRITE DEPT. FE, SUTTON, STEELE & STEELE, INC., 1031 SOUTH HASKELL, DALLAS, TEXAS

SUTTON, STEELE & STEELE, INC.

SEPARATIONS

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

How to Store Large Tonnages of Rock Salt in Limited Space

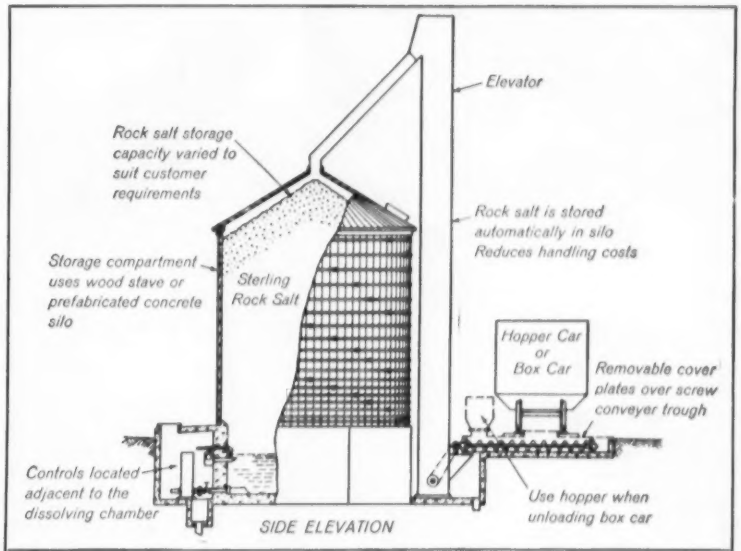
One of the best ways to increase salt-storage capacity, without taking up valuable indoor or outdoor plant space, is to install a "Silo Lixator." Developed by International, this space-saving unit—which *combines* salt storage with brine making—is especially practical where storage areas in or around the plant are at a premium.

The Silo Lixator makes excellent use of limited storage space, because it stores rock salt in a high, vertical column. The upper portion of the column stores dry salt. And the bottom of the salt column rests in a dissolving tank, where water is added to make brine. Whenever salt in this tank is dissolved to make brine, it is immediately replaced by dry salt flowing down from the upper portion of the column.

In addition—and this is an important, money-saving feature—there is ample space in the dissolving tank for brine storage. (The brine occupies the voids between the salt crystals.) This method of storing salt—with both dry salt and saturated brine present—is one form of "Wet Storage." It does away with the need for a brine-storage tank.

For storing any given amount of rock salt in dry form, ample space can be provided in the Silo portion, by building it to the proper height. The rugged steel, wood-stave, or prefabricated-concrete construction of the Silo assures long, dependable service.

Rehandling eliminated. Because dry salt stored in the Silo Lixator is dissolved to make brine, there is never any salt rehandling in the plant. A simple piping system, installed where it won't interfere with other operations, carries this brine to points of use. The brine is available simply at the turn of a valve. What's more, every drop of Lixate Brine is completely self-filtered by the rock-salt crystals at the bottom of the dissolving tank. Result: 100%-saturated brine which is always pure and crystal-clear.


Elevator
Rock salt storage capacity varied to suit customer requirements
Rock salt is stored automatically in silo Reduces handling costs
Storage compartment uses wood stave or prefabricated concrete silo
Sterling Rock Salt
Hopper Car or Box Car
Removable cover plates over screw conveyer trough
Controls located adjacent to the dissolving chamber
Use hopper when unloading box car
SIDE ELEVATION

THIS IS A TYPICAL SILO LIXATOR . . . built outside a plant so that rock-salt storage is no problem. The unloading method with this Silo Lixator is a screw conveyor underneath a railroad car.

Incoming salt shipments need no special handling. One of the more common delivery methods is the one pictured above: rock salt flows directly from a hopper car into a screw-conveyor trough, which, in turn, carries the salt to a bucket elevator. Another unloading method, possible when the elevator boot is low enough to permit gravity feed from the hopper car, is the gravity-feed chute.

Another money-saving feature: the Silo Lixator needs to be cleaned out only once every 12 to 18 months. The clean-out process is very simple: a valve or door is opened at the bottom of the dissolving compartment. All accumulated impurities are flushed through the clean-out, and the Silo Lixator is ready for use . . . needs no further attention for at least another year.

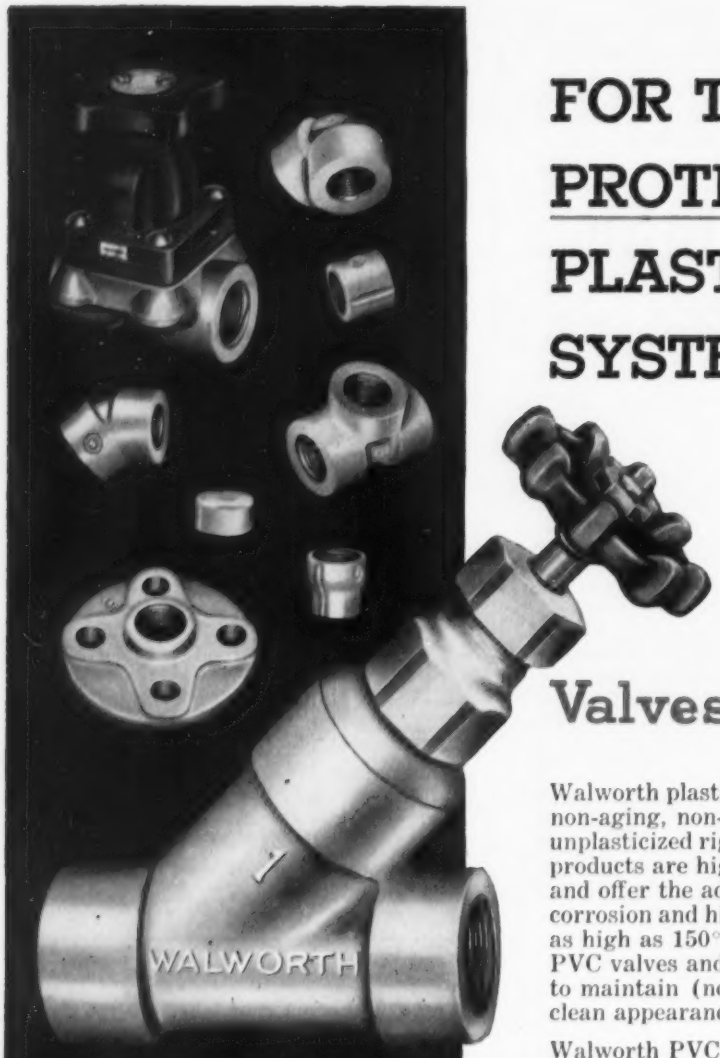
TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. And we also make automatic dissolvers in metal or plastic for both kinds of salt. So we can recommend the type and size of salt most perfectly suited to your needs.

If you'd like the assistance of an International "Salt Specialist" on any problem concerning salt or brine—or further information on the many Silo Lixator designs—just contact your nearest International sales office.

International Salt Co., Scranton, Penna.
Sales Offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; and Richmond, Va.

FOR INDUSTRY, FARM, AND THE HOME—
STERLING SALT
PRODUCT OF INTERNATIONAL SALT CO., INC.



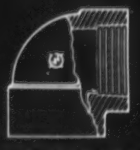
FOR THE LASTING PROTECTION OF PLASTIC PIPING SYSTEMS....

Specify WALWORTH PVC (rigid polyvinyl chloride) Valves and Fittings!

Walworth plastic valves and fittings are made of non-aging, non-corrosive and non-toxic unplasticized rigid polyvinyl chloride (PVC). These products are highly resistant to chemical attack and offer the advantages of immunity to galvanic corrosion and high impact strength at temperatures as high as 150°F. Durable and light, Walworth PVC valves and fittings are simple to install, easy to maintain (no painting), and add a smooth, clean appearance to your piping system.

Walworth PVC Y-Globe Valves are designed to regulate the flow of alkalies, acids, and similar corrosive fluids. Walworth PVC Diaphragm Valves* are commonly used in systems handling corrosive fluids, especially those containing suspended materials, and can be furnished with diaphragms suited to your application.

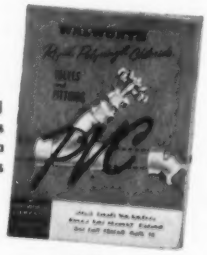
*Hills — McCanna (Saunders Patent)



90° SCREWED ELBOW

90° SOLVENT WELD-SOCKET TYPE ELBOW

A complete line of Walworth screwed and solvent weld socket type fittings are available in sizes from ⅛" to 4" and include 45° and 90° Ells and Tees . . . flanges . . . plugs . . . bushings . . . straight and reducing couplings . . . screwed and flanged unions . . . caps . . . nipples.



SEND FOR THIS BOOKLET. It describes mechanical and thermal properties, working pressures, sizes and dimensions, application and assembly data for the complete line of Walworth PVC Valves and Fittings. Please use company letterhead.

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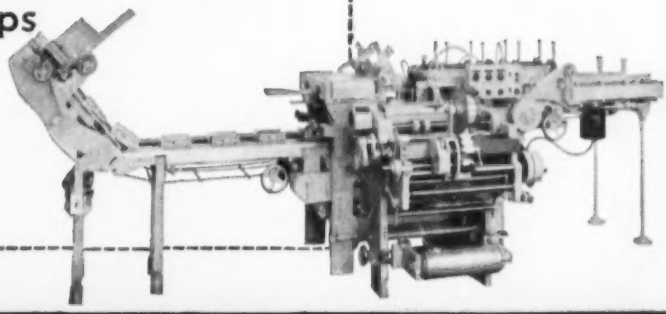
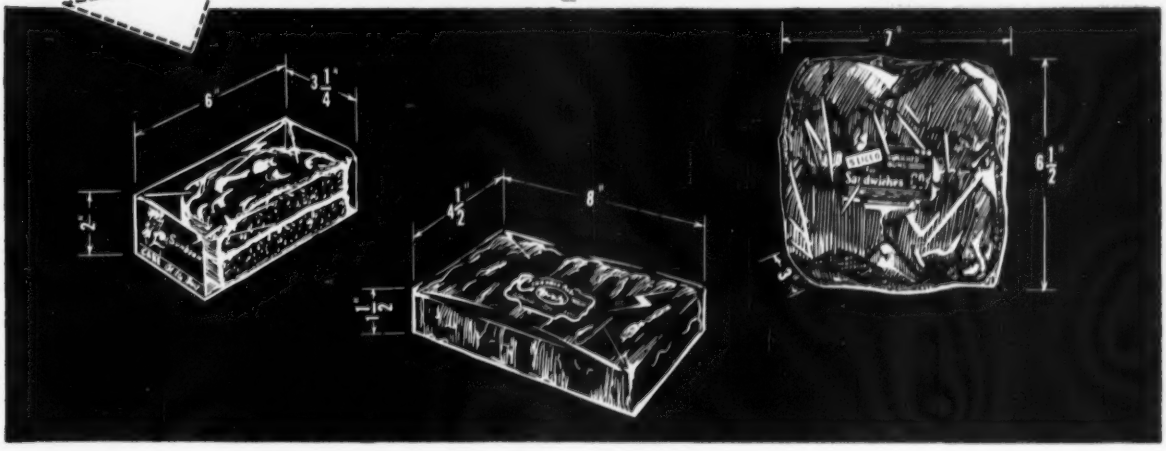
SUBSIDIARIES: ALLOY STEEL PRODUCTS CO. · CONOFLOW CORPORATION · GROVE VALVE & REGULATOR CO. · SOUTHWEST FABRICATING & WELDING CO., INC. · M & H VALVE & FITTINGS CO. · WALWORTH COMPANY OF CANADA, LTD.

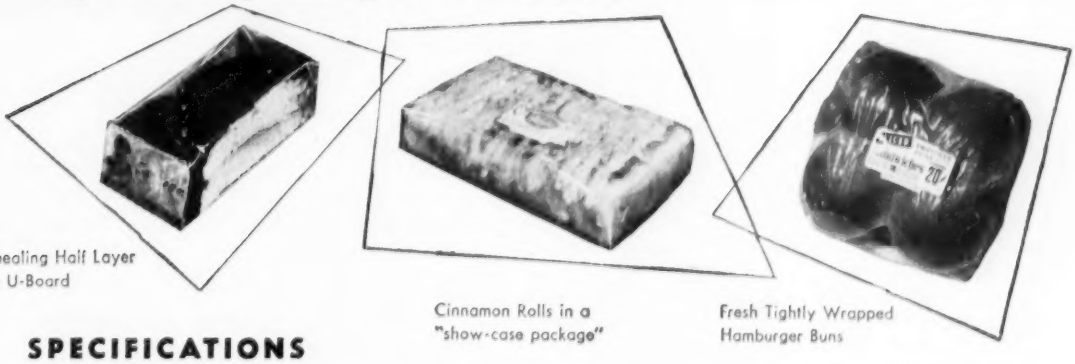
This Battle Creek Packaging Machine Model 47B

has handled overwraps within these ranges at speeds up to 70 packages per minute





to produce packages like these



Eye-Appealing Half Layer Cake on U-Board

Cinnamon Rolls in a "show-case package"

Fresh Tightly Wrapped Hamburger Buns

SPECIFICATIONS

Model 47B— Battle Creek's *"Continuous Flow"* design assures product protection plus "eye-appeal" at low cost. Highly versatile Model 47B attractively underwraps hamburger buns, weiner rolls, iced cinnamon rolls, layer cakes, jelly rolls, parkerhouse, brown 'n serve rolls . . . and a variety of round baked goods quickly, attractively. The paper handled includes self-sealing cellophane, wax-coated paper or laminated foil in economical roll form. Tight, firm packages at speeds of 40 to 70 per minute are attained on package sizes within lengths of 4" to 12", widths of 2¾" to 8" and heights of ½" to 4½". Changing from one size or shape to another can be expedited in 10 to 15 minutes.

Call on Battle Creek Packaging Machines today for complete, efficient service on all your packaging problems.

"Continuous Flow" Packaging

BATTLE CREEK packaging machines, inc.

109 TWELFTH STREET, BATTLE CREEK, MICHIGAN

For more data, circle this page number on card at back →

An eight-foot wide Sandvik steel-belt conveyor used for handling cans of shortening. The plant where this conveyor is installed has experienced up to 25 years of satisfactory service from an earlier Sandvik conveyor installation.

Sandvik steel-belt conveying work table makes cutting up of dressed hogs a continuous production line operation.

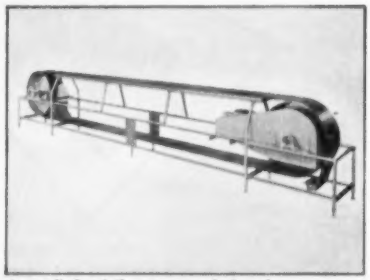
The smooth, impervious, easy-to-clean surface of Sandvik steel-belt conveyors has improved processing of a wide variety of foods. Here are some reasons why:

The conveying band provides a continuous, unbroken flat surface of stainless or carbon steel. — Live steam or boiling water can be applied directly. — Steel scrapers can be used for cleaning or discharge. — Withstands baking or drying temperatures. — No taste contamination. Smoothness facilitates slide handling (a vital advantage for can conveying). — High load capacity. — Long service life. — Belts can be of any length or width.

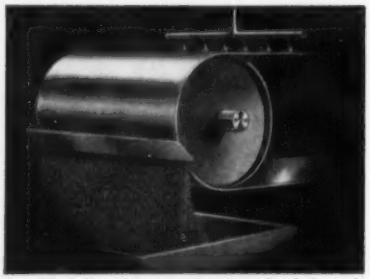
COOLING ARRANGEMENT—Sandvik conveyors can be built with a patented water-bed arrangement which cools from beneath . . . no water gets on top of the band. You can cool and convey, regulate thickness while cooling, cool and strip off gelatinous materials in sheet form, cool loose and pulverized materials, cool solids in sheet form and cool materials in layers.

ENGINEERING HELP—Sandvik's engineering department will be glad to work with you in designing a conveyor to fit your operation. Sandvik has had over thirty years of experience in designing conveyors to operate either as independent units or as integral parts of special processing equipment.

Write, wire or phone for further information.



A small Sandvik conveyor designed to cut meat handling costs.



Simplified illustration showing how Sandvik steel-belt was used in a continuous vacuum drier for soluble coffee. Scraper blade removes crystallized coffee from band.

SANDVIK
STEEL
BELT
CONVEYORS

SS-B5

SANDVIK STEEL BELT CONVEYORS
Division of Sandvik Steel, Inc.
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Tel. FAIR LAWN 4-6200
Branch Office: 230 N. Michigan Ave., Chicago 1, Ill.
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Manufacturers Of Steel Belt Conveyors For Over 40 Years

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PLANT ENGINEERING

Heat Reflecting Paints

Explains advantages and shows applications of special paints that reflect sun's heat. 12p.—*Tropical Paint Co., Cleveland. (197A)*

Variable-Speed Drives

Illustrates components of all-electric variable-speed drives. Units have printed circuits and a variety of control stations are available. Bulletin D-2505, 4p.—*Reliance Electric & Engineering Co., Cleveland. (197B)*

Vibratory Feeders

Describes vibratory feeders with variable control of rate of flow. Model F-115, 1p.—*Syntron Co., Homer City, Pa. (197C)*

Chemical Relief Valves

Publishes description of chemical relief and back pressure valves, including four sizes up to 1 in. Relief valves are used with corrosive liquids to 1,500 psi., and back pressure valves are used to 200 psi. Bulletin 357, 4p.—*Milton Roy Co., Philadelphia. (197D)*

Industrial Ovens, Dryers

Comprises application photos of various industrial ovens and dryers. Bulletin 157, 16p.—*Young Bros. Co., Cleveland. (197E)*

Right-Angle Gear Motors

Announces new line of right-angle gear motors from ¼ to 5 hp. Units have aluminum gear case and motor housings, high-grade gear bronze worm wheel, and carbon steel worm. Other features are described. Bulletin 193-557, 4p.—*Sterling Electric Motors, Inc., Los Angeles. (197F)*

Heat Exchanger Data

Explains how to engineer a heat exchanger. Also has thermal standards and reference data supplement. 16p.—*Condenser Service & Engineering Co., Hoboken, N. J. (197G)*

Stationary Field Drives

Presents technical data on air- and liquid-cooled stationary field drives and dynamic couplings. Also has explanation of principles, and dimension drawings. Form DSI-5, 10p.—*Eaton Mfg. Co., Kenosha, Wis. (197H)*

Multi-Zone Air Coolers

Indexed bulletin contains technical information on multizone air conditioning units. Tables, graphs, and sample problems aid equipment selection. Bulletin C-1100-B98P, 36p.—*Worthington Corp., E. Orange, N. J. (197I)*

Water-Tube Boiler-Burners

Considers performance of water tube boilers that have advantages of burner selection, separate delivery, and local service. Wide size range is available. Bulletin 900, 4p.—*International Boiler Works Co., E. Stroudsburg, Pa. (197J)*

Range of Pump Applications

Has application photos of pump line that includes 750 catalog models and thousands of special units. Form No. 409, 8p.—*Viking Pump Co., Cedar Falls, Iowa. (197K)*

How to Use Ice Machines

For commercial ice users, illustrated booklet explains applications of ice and automatic machines that make it. Bulletin HTU-7, 44p.—*American Gas Machine Co., Albert Lea, Minn. (197L)*

Cooling Tower Bulletin

Treats of induced-draft counter-flow cooling tower. Lists advantages, describes construction and effects of recirculation and surroundings. Has data sheet, photos, drawings, and charts. Bulletin CC-57-1, 32p.—*Foster Wheeler Corp., New York City. (197M)*

Tube and Shell Oil Cooler

Describes unit for cooling fluids in lubricating, power, and processing applications. Design data, operating figures, material speci-

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BACKSTAY WELT COMPANY, INC.
MANUFACTURERS OF QUALITY Welts - Gimps - Bindings
UNION CITY, INDIANA
SUBSIDIARIES IN CHICAGO, ILLINOIS; FENTON, MICHIGAN

May 23, 1957

The James Leffel & Company
426 East Street
Springfield, Ohio

Attention: Mr. J. Robert Groff,
President & General Mgr.

Dear Mr. Groff:

In August of 1954 we purchased one of your conservatively rated Leffel 75 HP oil fired Scotch Boilers. We have found that due to its rugged construction it will develop up to 150 HP, or double its conservative rating.

We were told that it would provide a continuous reliable and economical source of steam for many trouble-free years. When we bought this boiler we were sold on its strength of construction, and when we analysed all of the important quality features we got in the Leffel boiler, the price we considered to be fair. We realize that Leffel can not give all of these extra features for the lowest price, but we believe that in the end -- from our experience -- it turns out that it is the lowest actual cost to the customer.

After two and one-half years of constant use we are firmly convinced that the Leffel Scotch boiler does everything claimed for it, and much more besides. We like your conservative design and presentation, for when performance outruns promises the user is very happy indeed.

Our Maintenance Department states the fuel consumption is low and that we haven't had any repairs to make, and that the boiler is exceedingly responsive and easy to clean and maintain.

We certainly are well pleased with our Leffel boiler in every way. We also like to do business with a firm like yours which is almost one hundred years old and which -- it seems to us -- values the business and which looks after the interest of its customers.

With best wishes.

Yours very truly,
BACKSTAY WELT COMPANY, INC.
G. G. Barrim

G. G. Barrim

Low Cost Steam is a Reality at the Backstay Welt Company

The solidly constructed Leffel boiler at the Backstay Welt Company, Union City, Indiana, provides efficient, economical steam even when operating at double its normal rating.

The heavy-duty construction, economical maintenance and extra power of Leffel boilers can make low cost steam a reality for you, too.

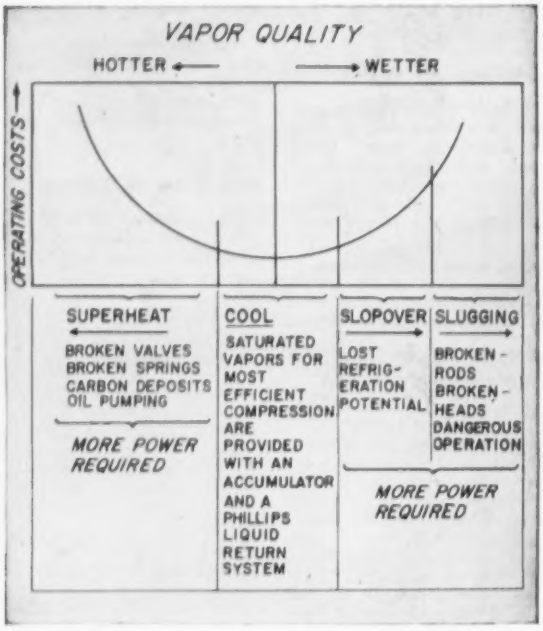
Many Leffel boilers throughout the country are still providing low cost steam even after 50 years of efficient service because they're built as only Leffel can build them.

Before you buy a boiler . . . take a look at Leffel. Available in sizes to meet requirements from 6 to 500 H.P., coal, oil or gas fired.

Bulletin 236, free on request, gives complete details on Leffel boilers for oil, gas or coal firing. If you need help in planning your boiler installation, Leffel engineers—backed by 95 years of experience in efficient steam generation—are available for consultation without obligation.

THE JAMES LEFFEL & CO.
FOUNDED IN 1862
MORE EFFICIENT STEAM GENERATION FOR 95 YEARS
Dept. E, SPRINGFIELD, OHIO

Liquid Ammonia Return Systems are Refrigeration's Preventive Insurance



Insurance at its best is insurance that *prevents* disaster. It's a much better buy than insurance which merely foots the bills while you get back in production after accidents. Phillips liquid ammonia return systems, which safeguard compressors against gulps of incompressible liquid ammonia, provide this sort of "insurance"— and it is quickly "paid up for life."

But liquid return systems are not in competition with insurance; in fact, many such systems are installed at the insistence of alert insurors who know a hazard when they see one.

Safety is a clear-cut reason for installing liquid return systems, but it is only one of several equally compelling reasons (see "VAPOR QUALITY" chart). *Economy of compressor operation* makes even more sense to the optimist ("It's a good compressor . . . How Can A Little Frost Hurt It?"). Cycling liquid ammonia through the compressor, even if it does not cause immediate damage, increases the power requirements and reduces the refrigerating effect produced. Liquid return systems by-pass liquid ammonia around the compressor and put it back where it belongs — in the evaporator. Here it can boost maximum or peak capacity of the entire system, it can raise cycle efficiency, and it permits full flooding of the evaporator coils without endangering the compressor.

Phillips liquid return systems are ruggedly built of top-quality materials, in many configurations and sizes, for a wide variety of custom-engineered installations. You will find it a simple matter to select and add the right Phillips system to your refrigeration cycle. You can make a good start in this direction by writing direct to the manufacturer for a more complete engineering discussion of liquid return systems. We give all inquiries prompt attention.

SEND FOR BULLETIN LRS-56 — TODAY!

PHILLIPS

H. A. PHILLIPS & CO.

DESIGNERS AND ENGINEERS
REFRIGERATION CONTROL SYSTEMS

3255 W. Carroll Ave. • Chicago 24, Illinois

fications, sizes and dimensions, and a handy sizing system are treated. Bulletin 12-C, 4p.—*Schuette & Koerting Co., Cornwells Heights, Bucks Co., Pa. (197N)*

Special Plastic Products

Covers properties and applications of fluorcarbon plastics for valves, pumps, and hydraulic and pneumatic service. Has photos, tables and drawings. Form AD-155, 16p.—*Garlock Packing Co., Palmyra, N. Y. (198A)*

2-Step Heavy-Duty Pumps

Has cut-away drawings of pumping units, with capacities to 4,500 gpm., that operate on two-stage principle. Form 7062-C, 12p.—*Ingersoll-Rand, New York City. (198B)*

Special Belting Line

Details make-up of belts for conveying and power transmission applications. Available in such varieties as friction surface, rufftop, cleated, vulcanized, and lapless endless. Colorful booklet also has selection tables and formulas. 8p.—*Voss Belting & Specialty Co., Chicago. (198C)*

Plastic Pipe, Fittings

Tables data on rigid high impact plastic pipe including advantages, applications, chemical resistance, dimensions, installation, physical properties, and other useful information. 16p.—*Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (198D)*

Steam Specialty Line

Well illustrated catalog describes large variety of steam traps, strainers, separators, pressure regulators, valves, and engine stops. Foldout chart offers concise presentation of steam trap pressures, capacities, and orifice sizes. Catalog No. 69, 60p.—*Strong, Carlisle & Hammond, Cleveland (198E)*

Cooling System Fittings

Displays over 600 items useful in refrigeration and air-conditioning. Catalog R-657, 24p.—*Madden Brass Products Co., Aurora, Ill. (198F)*

Hot Water Generator

Explains operation of forced recirculation water heater. Bulletin 1000, 4p.—*International Boiler Works Co., E. Stroudsburg, Pa. (198G)*

Corrosion Resistant Lining

Discusses cement-base formula for lining the interiors of steel water heaters, tanks, vats, and other bulk vessels. Includes lab test results. Bulletin PF-17, 4p.—*Pocono Fabricators Inc., E. Stroudsburg, Pa. (198H)*

PVC Valves and Fittings

Concerns rigid-type unplasticized polyvinyl chloride valves and fittings. Has discussion of technical points, corrosion resistance table, application photos, and tables. Bulletin 80-3, 8p.—*Joseph T. Ryerson & Son, Inc., New York City. (198I)*

MAINTENANCE

Mechanical Packings

Describes line of shaft and valve packings in braided, molded, and machined styles. For many services including acids, alkalis, and solvents. Bulletin C-325, 8p.—*Crane Packing Co., Morton Grove, Ill. (198J)*

Special Roof Coatings

Has detailed instructions on how to save old roofs by systematic use of a line of special coatings. Includes step-by-step instructions with photos. 20p.—*Tropical Paint Co., Cleveland. (198K)*

Hi-Temp Brazing Alloys

Discusses characteristics and physical properties of big line of brazing alloys and fluxes. Performance curves and application photos are shown. Form FD-23, 4p.—*Wall Colmonoy Corp., Detroit. (198L)*

Chemical-Resistant Paints

Shows available colors of a new paint line that can be sprayed or brushed on. Product is described as having chemical resistance, wide heat range, and long life. 4p.—*Wilbur & Williams Co., Boston. (198M)*

Dye-Penetrant Inspection

Colorful folder shows how to use spray-on dye materials to find cracks and defects in machinery. Form No. 16,669, 4p.—*Magnaflux Corp., Chicago. (198N)*

Proper Gage Glass Cleaning

Explains use of brushes to quickly and efficiently clean inside of liquid level gage glass. Unit 301, 1p.—*Jerguson Gage & Valve Co., Burlington, Mass. (198O)*

Steam Line Treatment

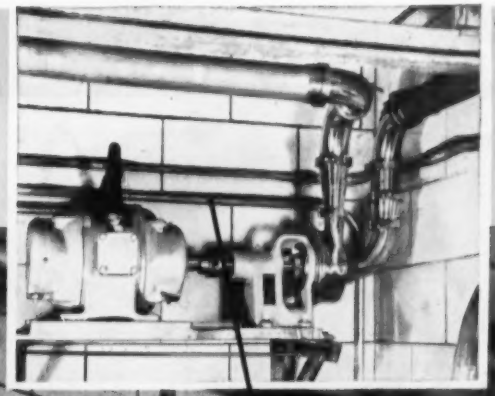
Offers liquid treatment that is stated to disintegrate and remove existing corrosion from steam systems. Reported as safe and simple to use. Bulletin M-A, 2p.—*North American Mogul Products Co., Cleveland. (198P)*

Silicone-Based Grease

Covers properties and performance of silicone-based grease developed for high-temperature,

TRI-CLOVER

Pump and Fittings play vital part in cooling operations at PETER HAND BREWERY CO.



This Tri-Clover Division centrifugal pump is in the cooler room of the Peter Hand Brewery, Chicago, Illinois. Nothing too unusual about that—you'll find Tri-Clover pumps serving breweries throughout the nation. However, to borrow a phrase from Peter Hand, "Something wonderful, we agree," is the fact that every golden drop that's produced at Peter Hand is boosted on its way from the "cool ship" to the centrifugal separators by this single pump. It's a tough, day-after-day job that demands dependability—the kind of job a Tri-Clover pump can do—and make it look easy!

Like all Tri-Clover products, the stainless steel Tri-Clamp® fittings also utilized in Peter Hand's processing lines are manufactured to the most exacting specifications and are designed to provide years of corrosion resistant service.

Our engineering staff, with many years of specialized experience and a thorough knowledge of liquid handling, welcomes the opportunity to work with you on your liquid conveying problems.

See your nearest TRI-CLOVER Distributor
EXPORT DEPT. 8 So. Michigan Ave.
Chicago 3, U.S.A.

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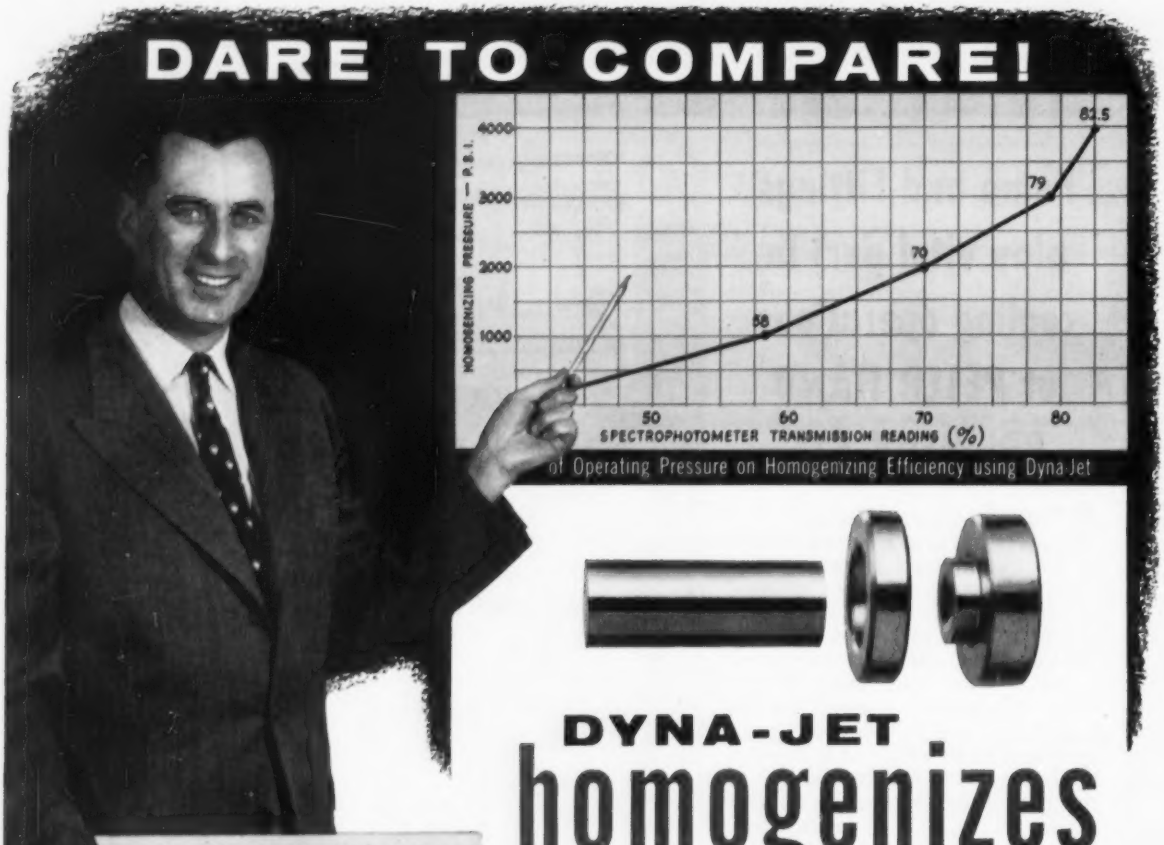
LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

TRI-CLOVER

DARE TO COMPARE!



of Operating Pressure on Homogenizing Efficiency using Dyna-Jet

Mr. John Hassell, Assistant Dairy Sales Manager, points to Dyna-Jet's increased efficiency at all pressures; and asks you to . . .

DARE TO COMPARE all the Gaulin Features

Heavy duty construction

Slowest average operating speed — proven longest life

Positive pressure lubrication

Long life nylon cylinder gaskets

Automatically adjusted plunger packing

Exclusive ball valve cylinder for abrasive products

and the revolutionary Dyna-Jet

MANTON Gaulin MANUFACTURING CO., INC. EVERETT, MASS.

DYNA-JET homogenizes better AT ALL PRESSURES

When you look at a homogenizer, look at the two factors most vital to your own operation — quality of end product and operating costs.

Gaulin Spectrophotometer charts show exactly what happens:

As pressures increase the degree of fat particle break-up becomes finer and finer . . . permitting more light to be transmitted through the test sample. At any given pressure, Dyna-Jet does a better, more efficient job than any other valve.

Result: A new fineness and uniformity in the homogenizing of milk. *Plus*, new opportunities to control operating costs by proper application of pressures, power consumption and efficiencies.

Truly, there's a new science to homogenizing. Dare to compare *all* the facts on homogenizing valves — ask to see and hear the remarkable story on the new Gaulin Dyna-Jet Valve and Light Transmission readings. Contact your local Manton-Gaulin dealer, or write: The Manton-Gaulin Manufacturing Co., Inc., 73 Garden St., Everett 49, Massachusetts.

MG 7-17

slow-speed bearings. Uses range from worm and pinion sets to compressor engine injector valves. Code 6-206, 4p.—*Dow Corning Corp., Midland, Mich. (198Q)*

Concrete Floor Coating

Has facts on modified epoxy flooring surface for corrosive spillage and traffic. Can be used to patch worn floors and resurface concrete. Bulletin 1100, 2p.—*Dittbrenner Associates, Inc., Rockaway, N. J. (201A)*

Solving Roof Problems

Explores how roofs are built, why they deteriorate, and how troubles can be diagnosed and treated. Field photos show various roof treatments. Bulletin F614C, 16p.—*Tremco Mfg. Co., Cleveland. (201B)*

Diverse Packing Line

Has data on composition of packings for specific food uses such as vinegar, citrus juices, and prune pulp. Also for regular boiler and pump uses. Bulletin A-131, 8p.—*Garlock Packing Co., Palmyra, N. Y. (201C)*

Drain Cleaner

Describes device for creating a sudden impact of water pressure for cleaning clogged-up drains. Has explanation of operating principles. 10p.—*Hydraulic Mfg. Co., Kiel, Wis. (201D)*

Circulating Oil Systems

Full-color brochure describes new types of circulating oil lubricating system. Product monitors its own operation through pressure sensing mechanism to warn of clogged or broken lines in any part of system. Bulletin 70, 8p.—*Farval Corp., Cleveland. (201E)*

Corrosion Inhibitor

Lists advantages of corrosion inhibitor for such circulating water systems as air conditioning, engines, compressors, and cooling. Bulletin 410-12-3, 6p.—*Hagan Chemical & Controls, Inc., Pittsburgh. (201F)*

PROCESSING

Magnetic Separators

Concerns combined magnetic separator and positive control feeder. Units may be either aluminum or wood and assembly drawings are shown. Bulletin TSB 6-654, 4p.—*Strong Scott Manufacturing Co., Minneapolis. (201G)*

Engineered Bread Coolers

Diagrams atmospheric, air conditioned, and forced-air coolers designed for floor, overhead, or floor-supported mounting. Grill tray construction allows air circulation around each loaf, and automatic tray washer is optional. 4p.—*Capitol Products Corp., York, Pa. (201H)*

72-Tube Rotary Steam Dryer

Lists capacities, based on initial and final moisture content, for drying a number of grain products in rotary steam dryer unit. Specifications, dimensions, accessory equipment, and advantages of the unit are also included. Bulletin 457, 4p.—*V. D. Anderson Co., Cleveland. (201I)*

Quick-Screening Hammer Mill

Presents diagram and specifications for four models of a hammer mill stated to offer quick-change screens, low operating costs, and high speed. Bulletin NPB6-629, 2p. — *Strong-Scott Mfg. Co., Minneapolis. (201J)*

Corrosion-Resistant Units

Offers choice of corrosion-resistant process equipment made of glassed-steel, clad steel, stainless, hastelloy nickel, inconel, titanium, and other alloys. Bulletin 936, 12p.—*Pfaudler Co., Rochester, N. Y. (201K)*

Woven Wire Cloth, Screens

Brand new catalog illustrates manufacture and applications of a line of wire cloth screens and other products. Numerous tables, trade definitions, photographs of mesh styles, and fabrications are included. Also has information on metals available, corrosion data, and conversion charts. 94p.—*Cambridge Wire Cloth Co., Cambridge, Md. (201L)*

Twin Rotor Mixing Units

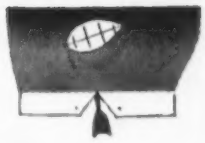
Describes two units, each with twin rotors. One is for dry ingredients or combining dry mixes with liquids. Other is a high-capacity, slow speed unit for mixing liquids with light bulky ingredients. Bulletin PSB6-665, 4p. —*Strong-Scott Mfg. Co., Minneapolis. (201M)*

Radiation Processing Facility

Informs on availability of a high-energy electron radiation installation under time-rental terms. New center is designed for independent laboratory investigation and production runs. Construction and advantages of system are discussed. Bulletin F, 6p.—*High Voltage Engineering Corp., Burlington, Mass. (201N)*

Engineering Pulverizer Uses

Has cutaway drawings that show how pulverizing units grind, classify, and convey in one operation. Engineering service including free test grinds, detailed report, complete mill plan, and field engineer-



The tale of an embarrassed Manufacturer

He shaved a tenth of a cent from his production cost. He did it by using an inferior flavor. He couldn't quite understand why his sales were so low... his profit so small ... his embarrassment so financial.

The moral is plain to see. Quality builds consumer acceptance ... greater sales ... more profit. Realize this goal with **P & S flavors** Write for free samples.

POLAK & SCHWARZ, INC.

667 WASHINGTON ST., NEW YORK 14, N.Y.

Offices: Chicago, Ill.; Los Angeles, Calif.; Toronto, Can.; Plants: Teterboro & Guttenberg, N. J.; Culver City, Calif.; New York, N.Y.

JAYHAWK MILLS

It's Jayhawk Mills for Higher Quality Products

HIGH PRODUCTION ....
Production records achieved under actual plant operating conditions proves the tremendous capacity of this mill. No machine of similar size or cost matches the production of the Jayhawk Mill..

GUARANTEED ....
All Jayhawk mills are guaranteed to be free of any defective material or workmanship.

COMPACT ....
Compactness designed into the Jayhawk Mill enables it to occupy only a small fraction of valuable plant area.

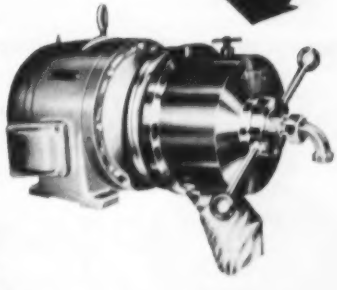
DEPENDABLE ....
No maintenance trouble with the Jayhawk Mill. The rugged heavy duty thrust bearings have ample strength to withstand severe service.

EXCLUSIVE DESIGN FEATURES THAT GIVE LONG DEPENDABLE SERVICE

★ **STRENGTH** to withstand severe service

★ **POWER** to handle any material

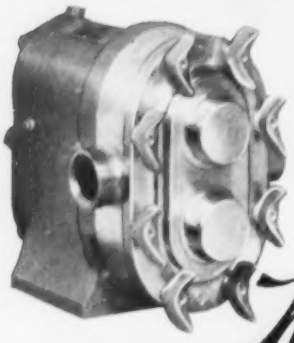
★ **SIMPLICITY** so that any operator can handle it.



Mills of Quality
For Quality Production

Jayhawk Manufacturing Co., Inc.
120 North Adams Hutchinson, Kansas

FOOD PROCESSORS!



Check this list of Design Benefits in

Waukesha

SANITARY P.D.* PUMPS

. . . then clip and file

You don't have to guess the performance and engineering benefits you get in a WAUKESHA Sanitary Pump. The most important are listed in the left hand column. But *do* check the benefits offered by other pumps. And when you add up the blank spaces in the right hand column — you'll buy WAUKESHA!

WAUKESHA	OTHER
Perfect O-Ring sealing against product leakage or air intake *without* troublesome packing glands.	
Only sanitary corrosion-resistant non-abrasive metal impellors.	
Stainless steel positive drive shaft sleeve to save costly shaft wear.	
No small radius corners, short diameter grooves or soil and bacteria-collecting corners.	
NO MATERIAL other than metal (and that of a non-flavor imparting type) in contact with the product.	
A pump that meets 3-A Standards and the approval of the U. S. Public Health Service.	
A pump that provides side mounting.	
A pump that provides a vented cover to protect personnel and equipment against back pressure accidents.	

How is the score? WAUKESHA's ahead?

The features listed are but a few of the many you'll find in the new WAUKESHA P.D. Sanitary Pump. They are all described and illustrated in the WAUKESHA Catalog — yours on request. Just send a postcard for Bulletin 1957.*

ONLY Waukesha gives you a quarter century's experience and reliability

Waukesha FOUNDRY COMPANY

*Positive Displacement

Dept. A-9, Waukesha, Wisconsin

ing service is also described. 4p.—*Schutz-O'Neill Co., Minneapolis. (201O)*

Dry Processing Equipment

Informs on use of air separators in closed-circuit grinding, fluid energy mill grinding, rotary batch blenders, and crushing and grinding machines. Photos, drawings and data tables are included, 8p.—*Sturtevant Mill Co. Boston. (202A)*

Continuous Freezing Unit

Depicts construction highlights of continuous freezer designed for high-speed production. Bulletin 430, 4p.—*Proctor & Schwartz, Inc., Philadelphia. (202B)*

Pellet Cooler and Dryer

Informs on construction, operation, and installation of pellet cooler and dryer with conveying system. Scale drawing shows how unit may be used as part of company's cooling, drying, crumblizing, cleaning, and grading system. Bulletin 177, 4p.—*Sprout, Waldron & Co., Inc., Muncy, Pa. (202C)*

Vibrating Screen Units

Presents operating and application data on vibrating screen separators. Fold-out pages have dimension drawings of various models. Bulletin F-561-R, 22.—*Southwestern Engineering Co., Los Angeles. (202D)*

Heavy-Duty Pellet-Maker

Provides details on unit that forms powdered and dusty material into compressed pellets for better handling. Equipment is stated to be heavy-duty and simply operated. Bulletin 182, 4p.—*Sprout-Waldron & Co., Muncy, Pa. (202E)*

Sanitary Ribbon Blenders

Lists specifications and dimensions for a line of ribbon blenders with sanitary design. Has close-ups of special construction features. 4p.—*First Machinery Corp., Brooklyn, N. Y. (202F)*

Side-Entering Agitators

Explains company's policy of engineering units into the line according to basic process data. Also has design details of latest side-entering agitators, table of sizes and dimensions, and an outline of supplementary information supplied with each installation. 8p.—*Industrial Process Engineers, Newark, N. J. (202G)*

Centrifugal Dust Separator

Discusses design improvements and applications of heavy-duty cyclonic dust separator. Also has air flow resistance and dust recovery curves, temperature and pressure correction formulae, selection chart, dimensions, and supports and accessories. Bulletin 576, 12p.—*Day Sales Co., Minneapolis. (202H)*

Screening by Gravity

Describes design, operation, and advantages of unit for wet screening non-fibrous slurry feeds. Unit consists essentially of concave, wedge bar type screen in a stationary housing with no moving parts. Bulletin 2300, 4p.—*Dorr-Oliver, Inc., Stamford, Conn. (202I)*

Rotary Batch Blenders

Specifies information on nine blender models. Units are stated to have rotary drum design that saves plant space, including headroom. Sectional view points out special details. Brochure BL-157, 4p.—*Sturtevant Mill Co., Boston. (202J)*

Dairy Products Process

Describes and explains operations and principles of unit for vacuum-heat-treating dairy products. Attached reprint discusses possible improvements in milk products flavor. Bulletin E1255, 9p.—*Creamery Package Mfg. Co., Chicago. (202K)*

MATERIALS HANDLING

Industrial Wheel Catalog

Displays line of industrial wheels including new aluminum unit available with natural rubber, static conductive compound, or neoprene tires. Details of bearing construction are shown. 8p.—*R & K Industrial Products Co., Richmond, Calif. (202L)*

10,000-lb. Lift Trucks

Specifies engineering, design, and construction features of high-capacity lift trucks that are stated to have operating, performance, and maintenance advantages for users. Bulletin 334A, 6p.—*Allis-Chalmers Mfg. Co., Milwaukee. (202M)*

Movable Belt Conveyor

Illustrates typical applications and construction features of portable belt conveyor unit. Bulletin No. 600, 4p.—*A. B. Farquhar Div., York, Pa. (202N)*

Materials Handling System

Informs on metal containers that are picked up, delivered, and dumped by special trucks. Folder A-304-F-2, 4p.—*Dempster Bros., Inc., Knoxville, Tenn. (202O)*

Rubber Tired Wheels

Has facts on special wheels that are said to retain their concentricity under maximum load, and

Ninety million fish a year pass over this Wissco Belt. This belt, costing 30% *less* than those previously used by North Atlantic, has already lasted over 16 times longer.

WISSCO BELTS *and the North Atlantic Fish Company*

The story of Wissco Belts is best told by their users. For instance, President Frank Cefalo of North Atlantic Fish Company, Gloucester, Mass., reports:

"By switching to a Wissco Belt in 1948, we eliminated semi-annual belt replacements . . . increased our production flow by 100% . . . reduced our labor force by 8 men . . . and effected, *in addition*, a direct, immediate cost saving of at least $15,000 annually."

And he goes further. "Not only is the Wissco Belt more durable than any other belt we've ever used, but it performs its function with greater efficiency. Since ours is a volume production operation, we're able to get our products to the market faster—a factor that has improved our overall profit situation."

North Atlantic uses their Wissco Galvanized Balanced Spiral Belt to convey fresh fish from the dock up a 30% incline to a weighing station. As the fish move along the belt, workers remove ice left on the fish when they leave the trawlers. "With the belts we previously used, the fish continually slipped back down the belt," Mr. Cefalo continues. "So we had to use sixteen men on this station—most of whom were engaged in a constant, irritating and expensive battle to keep the fish on the belt. Now, the wire mesh surface of our Wissco Belt has eliminated this problem, allowing us to reduce the men on this station to eight.

"In addition, our Wissco Belt does not loosen, crack or part at the seams when exposed to moisture from the fish and ice chips. These failures occured on an average of once a week with the belts we formerly used. The resultant work stoppages immobilized 150 workers throughout the entire plant for at least an hour and a half each time. Elimination of these stoppages, through installation of a Wissco Belt, saved us $300 a week in direct costs, plus a gain in our overall production figures."

If you have a processing or conveying operation, chances are that Wissco Belts can help you as they have helped the North Atlantic Fish Company. It will pay you to get the complete story today from our nearest sales office.

CF&I **WISSCO BELTS**

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago
Detroit • New Orleans • New York • Philadelphia
CF&I OFFICES IN CANADA—Toronto • Montreal

4536

"these steam traps save us 30,000 gals. of fuel oil a year"

Yarways are responsible for cutting our fuel oil bill 20%

Q. Mr. Melcher*, you've been using Yarway Impulse Steam Traps in this packing plant for over two years. What's your experience?

A. It's all been good. As a direct result of changing to Yarway Traps we save 30,000 gallons of fuel oil a year—or about 20% on our oil bill. Temperatures now stay hot and steady.

Q. Where do you have these Yarway Traps installed?

A. On all the steam coils for the smokehouses, heating exhaust fans and hot water generators.

Q. How about maintenance?

A. We haven't touched a Yarway Trap in the two years we've had 'em. With only one small moving part, there's not much to go wrong. Previously, with other traps, we averaged over $300. a year for trap maintenance.

Q. You'd recommend Yarway Impulse Steam Traps, then?

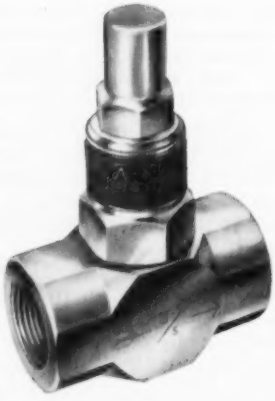
A. I don't have to. The record speaks for itself!

If you'd like a copy of a new booklet, "The How and Why of Steam Trapping", drop a card to

YARNALL-WARING COMPANY
127 Mermaid Avenue,
Philadelphia 18, Pa.

We have Yarways on steam coils for all our smokehouses

*GEORGE E. MELCHER, *Chief Engineer, large eastern meat packing plant.*



YARWAY impulse ...a good way to specify steam traps

OVER 1,200,000 YARWAY IMPULSE STEAM TRAPS ALREADY USED • STOCKED AND SOLD BY 275 CONVENIENT LOCAL INDUSTRIAL DISTRIBUTORS • NATION-WIDE YARWAY ENGINEERING STAFF AT YOUR SERVICE.

thus roll easier. Bulletin 1302, 4p.—*Roll-Rite Corp., Oakland, Calif. (202P)*

How to Get 58 Films

Gives addresses and instructions for obtaining any of 58 different films on material handling. 24p.—*The Material Handling Institute, Inc., Pittsburgh. (205A)*

Man-Output Information

Reports on one man crew material handling system that is said to eliminate time wasted in waiting. Includes fully-illustrated analysis of system. Bulletin 153, 8p.—*Lewis Shepard Products, Inc., Watertown, Mass. (205B)*

Vulcanized Fiber Containers

Color catalog details line of vulcanized fiber trucks, trays, boxes, baskets, seamless roving cans, and barrels. Informs on uses, sizes, colors, and features of each item. 16p.—*Continental-Diamond Fibre Corp., Newark, Del. (205C)*

High-Capacity Lift Trucks

Details construction and applications of lift truck line with capacities running to 20,000 lb. Bulletin 5230, 16p.—*Yale & Towne, Philadelphia. (205D)*

Portable Screw Conveyor

Pictures applications of portable screw units extendable from 30 to 60 ft. Capacity runs to 2,500 bu./hr. of grain. Form A422, 2p.—*Baughman Mfg. Co., Inc., Jerseyville, Ill. (205E)*

Gas-Powered Lift Trucks

Two catalogs cover models of portable lifters ranging from 2 to 7,000 lb. capacity. Details are presented in easy-to-read attractive fashion. Bulletins 1348-A, 1395, 8p.—*Baker-Raulang Co., Cleveland. (205F)*

Portable Produce Conveyor

Explains construction and use of lightweight conveyor available in lengths to 32 ft. Form PC-6/57, 2p.—*Red Cross Mfg. Corp., Bluffton, Ind. (205G)*

Many Types of Casters

Full-color presentation indexes various models and sizes of 40 different types of casters. Simplified guide shows the proper units to use in specific applications. Catalog 157, 80p.—*Faultless Caster Corp., Evansville, Ind. (205H)*

Bolted Steel Storage Tanks

Shows applications of steel-section tanks used for storing grain products. Construction features and advantages are disclosed. Catalog 15E-09, 8p.—*Black, Sivalls & Bryson, Inc., Kansas City, Mo. (205I)*

Crane Selection Manual

Tabbed booklet makes selection of overhead cranes easy by step-by-step process. Includes much data on these units. Bulletin 15,005, 28p.—*Manning, Maxwell & Moore, Inc., Muskegon, Mich. (205J)*

Portable Belt Conveyor

Describes wheeled unit for loading at angles up to 30 deg. Has simplified drawings of optional equipment. Bulletin 50AA, 4p.—*E. W. Buschman Co., Cincinnati. (205K)*

Big Line of Trucks

Color catalog shows fork-lift trucks, straddle carriers, powered hand trucks, and towing tractors. Models are designed for many different applications. Bulletin TC94, 16p.—*Clark Equipment Co., Battle Creek, Mich. (205L)*

Bulk Handling Equipment

Has photos and drawings of tanks for handling bulk materials as well as pneumatic conveying equipment. Custom fabricating service and accessories are also explained. Bulletin 574, 12p.—*Day Sales Co., Minneapolis. (205M)*

INSTRUMENTS

Heat, Pressure Controls

Includes description of more than 34 basic types of industrial temperature and pressure controls. Self-operating regulator, water mixing equipment, pneumatic control instruments, indicating and recording instruments, control valves, and pneumatic motors are covered. 96p.—*Powers Regulator Co., Skokie, Ill. (205N)*

Automatic Valve Actuator

Has details on a self-contained unit designed for proportional-position control, using an electronic monitor, manual station, or direct connection to a measuring element. Components of the unit include an electrical input signal system, relay, hydraulic cylinder, and an oil pump. Bulletin 38.3, 4p.—*Askania Regulator Co., Chicago. (205O)*

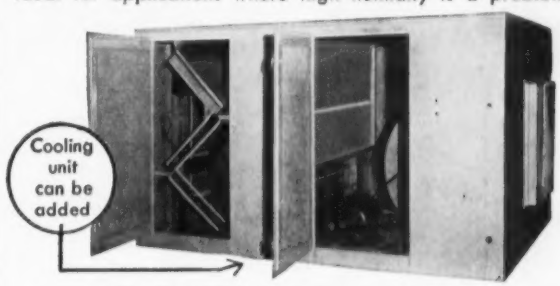
Air Velocity Meter

Explains functioning and applications of unit that reads both suction and supply air velocities. Many components shown. Bulletin 2448, 8p.—*Illinois Testing Laboratories, Inc., Chicago. (205P)*

Dynamic Process Control

Describes systems that program and regulate one or a number of transient variables in a process with accuracy. Computer techniques and circuitry are employed.

The new
KLIMATIC KING
a compact heating, ventilating unit
Ideal for applications where high humidity is a problem



Designed for dairy, ice cream and food processing plants, the Klimatic King is fabricated with a corrosion-resistant galvanized steel casing, insulated to eliminate condensation and dripping. Automatic controls for temperature and ventilation. Two speed motor for "high" and "low" production periods, provides maximum economy of operation. These and many other features are standard with the Klimatic King, not "optional extras". The quality leader in its field. Sizes 3,500 to 20,000 CFM.

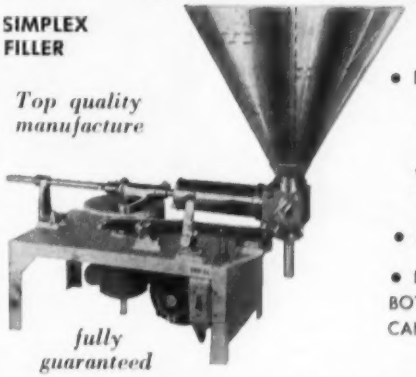
Write for detailed technical bulletin. More than fifty years experience is at your disposal. Write today

THE King CO. OF OWATONNA
905 NORTH CEDAR ST. OWATONNA, MINNESOTA
MANUFACTURERS OF SHARP FREEZE, COOLING, VENTILATING AND HEATING SYSTEMS

This inexpensive filler does your filling job!

SIMPLEX FILLER

Top quality manufacture



fully guaranteed

- HANDLES LIQUIDS AND SEMI-SOLIDS!
- ADJUSTABLE 1 TO 32 OZ.!
- EASILY CLEANED
- FILLS 15 OR 30 BOTTLES, JARS OR CANS PER MINUTE!

Write for circular on this Model A filler or on the Simplex automatic fillers

F. L. BURT CO.—571 7th ST.—SAN FRANCISCO 3, CALIF.
PHONE KLONDIKE 2-2020

Name .....
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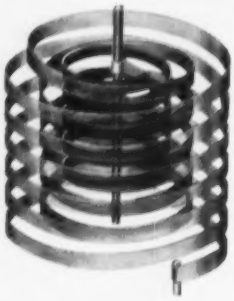
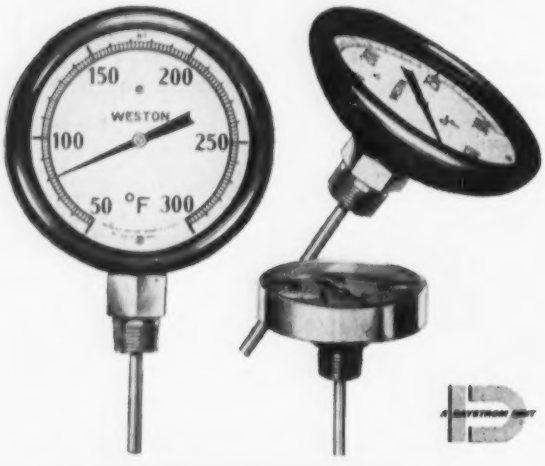
THE

REVERSE TWIST



MAKES A BIG DIFFERENCE!

You can readily picture the difference. In the Weston industrial bi-metal thermometer the sensitive element is a *multiple* helix rather than the conventional single one. Therefore a longer bi-metal strip can be used, yet it can be wound into a shorter element with greater rigidity and stability, better repeatability, fast thermal response and the ability to withstand high overloads. In service this means sustained accuracy, over longer periods, at far lower over-all costs. Available in types, sizes and ranges for industrial applications and all built-in needs. Catalog T-13-K gives the complete story. Write . . . WESTON Electrical Instrument Corp., 617 Frelinghuysen Avenue, Newark 5, N. J.



WESTON

Bimetal

THERMOMETERS

Bulletin G-102, 24p.—*CDC Control Services, Inc., Hatboro, Pa. (205Q)*

Viscosity Control System

Concerns unit for automatic addition of solvent to correct viscosity for evaporation losses. Bulletin V-1212, 2p.—*Norcross Corp., Newton, Mass. (206A)*

Machine-Use Time-Meters

Catalogs line of meters that indicate operating time, shut-down time, total operating life, and correct servicing intervals for machines. Bulletin GEC-472F, 2p.—*General Electric, Schenectady, N. Y. (206B)*

Rotameter Selection Gadget

Employs die-cut disk to indicate pressure and temperature limitations of rotameters, as well as their flow capacity ranges. Brief descriptions of meters can be read on opposite page. Bulletin 110, 4p.—*Brooks Rotameter Co., Lansdale, Pa. (206C)*

Small-Case Instrument Line

Catalogs compact instruments for indicating, transmitting, and controlling pressure and temperature. Glass fiber cases allow use outdoors or in corrosive atmospheres. Catalog 51-1450, 16 p.—*Fischer & Porter Co., Hatboro, Pa. (206D)*

Specific Gravity Meter

Refers to a transducer unit designed to measure specific gravity continuously. It may be used to correct a flow rate instrument to obtain gravimetric flow rate of a fluid. May also be used to indicate specific gravity. Bulletin F4, 4p.—*Potter Aeronautical Corp., Union, N. J. (206E)*

Controls and Stations

Catalog, in color, gives details on controllers and control stations. Has index, clear drawings, and attractive photos. Bulletin 5013, 18p.—*Moore Products Co., Philadelphia. (206F)*

Thermocouple Assemblies

Catalogs variety of thermocouple assemblies with numbers, sizes, prices, and ordering information. Bulletin TA-457, 4p.—*Claud S. Gordon Co., Chicago. (206G)*

Automatic Control Motor

Informs on electric motor for operation of final elements in automatic control systems. A variety of models are available and several applications are shown. 8p.—*Minneapolis-Honeywell Regulator Co., Philadelphia.*

Water Vapor Recorder

Contains design drawings of continuous water vapor recorder for measuring low concentrations in gas streams. Bulletin 0714-1, 4p.—*Mine Safety Appliances Co., Pittsburgh. (206H)*

Continuous Viscosity Unit

Describes device that continuously measures and records both temperature and temperature-compensated viscosity of liquids flowing in process piping. Catalog 15A100, 4p.—*Fischer & Porter Co., Hatboro, Pa. (206I)*

PACKAGING

Printing Products

Catalog, in color, shows offering of standard and special labels. Company also produces booklets, brochures, and magazines. 24p.—*Ever Ready Label Corp., New York City. (206J)*

Electronic Check Weigher

Explains operation of automatic electronic package classifier suited for check-weighing small packages. Form T-9510, 2p.—*Toledo Scale Co., Toledo, Ohio. (206K)*

Bottle Protective Coatings

Explains structure of glass, reasons for bottle coatings, and describes most types of coatings. Written in layman's terms. 6p.—*Thatcher Glass Mfg. Co., Inc., Elmira, N. Y. (206L)*

Marking Equipment Line

Covers marking, dating and coding machines. Shows standard and custom units. 8p.—*Industrial Marking Equipment Co., Inc., Brooklyn, N. Y. (206M)*

Glass Container Statistics

Tables data for production and application of glass containers. 48p.—*Glass Container Manufacturers Institute, Inc., New York City. (206N)*

Packaging Application News

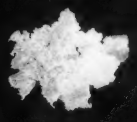
Relates results of applications of various packaging materials to specific products. Has other late packaging stories. Packages and People, Vol. 21, No. 3, 16p.—*E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. (206O)*

Over-Under Scale Line

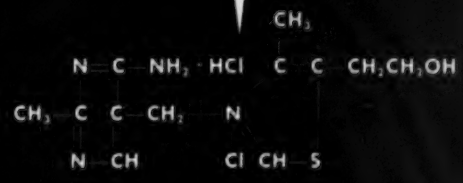
Offers 34 different check weight scales having capacities up to 100 lb. Includes photos and tables of important dimensions and specifications. Form 3333, 8p.—*Exact Weight Scale Co., Columbus, Ohio. (206P)*

Meat Packing Case Histories

Illustrates studies of the use of polyethylene film by meat and poultry packers. Advantages of



VITAMIN B_1 COMES RIGHT FROM ROCHE



Roche makes 'Roche' thiamine (vitamin B_1) "by the tons."

Mononitrate and hydrochloride types are always ready for all your needs—every quantity you will ever require—all the quality you will ever demand.

For nutritive supplements, food or cereal enrichment, as well as oral pharmaceutical preparations, the mononitrate or hydrochloride is instantly available; for injectable products our long-preferred ampul type hydrochloride is always ready for immediate shipment to pharmaceutical makers.

Roche proudly produces vitamin B_1 under careful, constant control . . . packed to reach you quickly from convenient shipping points . . . unharmed, untouched, unsurpassed.

Roche is the right one to help you manufacture fine B_1 pharmaceuticals that meet or exceed the most rigid U.S.P. specifications. If you manufacture or process foods, 'Roche' thiamine can help your products meet the highest standards, including Federal Definitions and Standards of Identity that exist for certain enriched foods.

ORDER right . . . ORDER from Roche

VITAMIN DIVISION
HOFFMANN-LA ROCHE INC.

NUTLEY 10, NEW JERSEY, NUTLEY 2-5000 • NEW YORK, OXFORD 5-1400

(Illustration represents actual crystals under high magnification, using shadow technique.)

Why you should use 'ROCHE' THIAMINE

HYDROCHLORIDE AND MONONITRATE

(vitamin B_1)

Here are ten persuasive reasons why 'Roche' thiamine should be your choice for manufacturing purposes

1. **U. S. P.** Both 'Roche' thiamine hydrochloride and mononitrate equal or exceed U. S. P. specifications.

2. **TWO TYPES.** Roche has *two types* of thiamine hydrochloride available for you:

   Regular—*for tablets, capsules, dry and liquid nutritive supplements and multivitamin preparations.*

   Ampul—*specially prepared for use in manufacturing parenteral solutions.*

3. **SPECIAL PROBLEMS.** Roche has thiamine mononitrate to help you meet unusual stability problems which can occur in dry cereal or pharmaceutical products. Also it may have advantages in certain pharmaceutical products where the pH range is above the safe level for the hydrochloride.

4. **STEADY SUPPLY.** Because Roche makes *quality* thiamine by the tons, you can be sure of a steady, *quality* supply.

5. **RESEARCH.** Continuing world-wide research brings you the latest developments in vitamin knowledge.

6. **PRODUCTION CONTROL.** Scientific production control assures you of consistent, highest quality.

7. **QUICK DELIVERY.** Every order receives prompt careful service from convenient points. Transportation at lowest rate allowed and prepaid to destination. Special routings at cost. And you *know* you can count on our promises.

8. **PACKAGING.** Packed in polyethylene bags in ½ and 1-kilo tamper-pruf metal containers and in fibre drums up to 20 kilos for the hydrochloride, 35 kilos for the mononitrate. Small quantities in amber S.C. bottles. *Ampul type* thiamine hydrochloride is sealed under inert gas in 100 gram S.C. bottles and in ½ and 1-kilo tamper-pruf metal containers.

9. **KNOW-HOW.** Roche know-how on vitamins can help you with solutions to compounding and packaging problems.

10. **SAMPLES** and technical assistance are yours on request. Ask your Roche salesman or write the Vitamin Division.

Make a note now... **CALL ROCHE FOR VITAMINS**

Vitamin Division • HOFFMANN-LA ROCHE INC. • Nutley 10, New Jersey

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Pacific Coast distributor: **L. H. BUTCHER COMPANY, San Francisco • Los Angeles • Seattle • Portland • Salt Lake City**

In Canada: **Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec**

this material are described. Bulletin J-935, 12p.—*Bakelite Co., New York City. (206Q)*

Multiple Cartoning System

Describes automatic unit specifically designed to carton varying combinations of cans, tailored to the needs of the packager. Up to 120 carriers per min. capacity. 4p.—*Continental Can Co., New York City. (209A)*

Many Labeling Applications

Seven bulletins cover a line of labeling units that can be applied to a variety of packages. Included among the jar and can labelers are turret, continuous motion, ketchup, and rotary units. Bulletins CU67, CL255, CA265, CM264, K286, RO271, and P272, 30p.—*Economic Machinery Co., Worcester, Mass. (209B)*

Automatic Flour Packer

Describes system consisting of following four units: (1) Triple screw type feeder, (2) automatic flour scale, (3) auger packer, and (4) bag sewing conveyor. Each is discussed in detail and engineering drawings are given. Bulletin 0157, 4p.—*Richardson Scale Co., Clifton, N. J. (209C)*

QUALITY CONTROL

Precise Control Buret

Concerns Ultra-Buret, a lab instrument said to offer accuracy, high capacity, speedy operation, and durable construction. 4p.—*Scientific Industries, Inc., Springfield, Mass. (209D)*

Electric Heating Tapes

Announces line of silicone rubber embedded tapes for safe heating of apparatus in the presence of moisture, inflammables, deteriorating chemicals and gases. 4p.—*Burrell Corp., Pittsburgh. (209E)*

Biochemical Price List

Offers line of biochemicals including ten new products and radio-chemicals. 21p.—*Schwarz Laboratories, Inc., Mount Vernon, N. Y. (209F)*

Dairy Products Tester

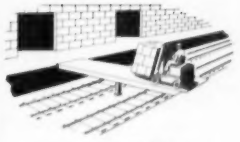
Describes unit for accurate testing of quality of dairy products. Has chart showing savings possible by accurate control of butter fat content. Bulletin 353-16, 4p.—*Mojonnier Bros. Co., Chicago. (209G)*

Rotary

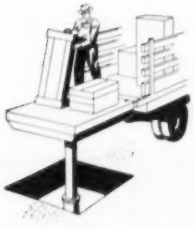
OILDRAULIC® POWER

Cuts the cost of lifting heavy loads

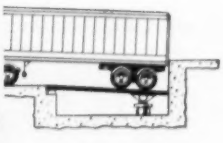
Leva-Dock Ramps



Transfer Bridges



Levelator Lifts



Truck Leveler

WRITE FOR CATALOGS

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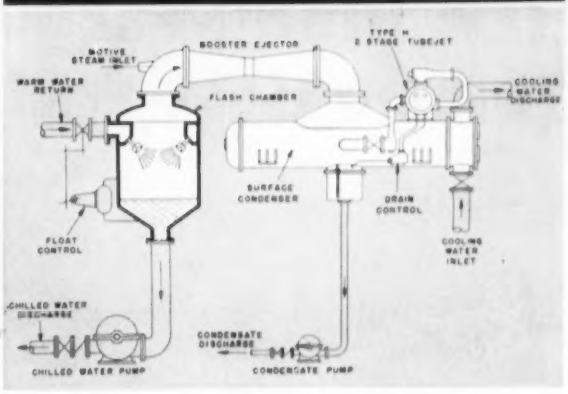
Save money 2 ways



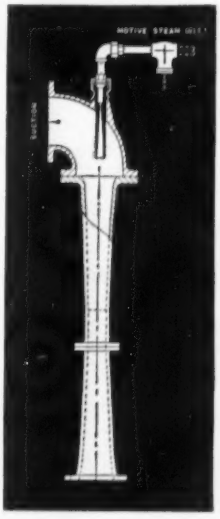
Above schematic diagram shows Wheeler Jet Vacuum Refrigeration Unit with surface condenser. Unit is easily adapted to low level jet or barometric jet condensers.

when you CHILL Fruits, Meats, Vegetables or PROCESS WATER

C. H. Wheeler Steam Jet Vacuum Refrigeration operates at exceptionally low cost because it uses low pressure exhaust steam—steam that would otherwise be wasted in your processing plant.

Maintenance costs are unusually low, too, because there are no moving parts, except for those in the chilled water pump. No noise or vibration, either, with Wheeler Steam Vacuum Refrigeration.

It's an ideal refrigeration system for any application requiring chilled water temperatures of from 35° to 65°F. Wheeler Jet Vacuum Refrigeration has proved itself time after time in the chemical, food and process industries.



See your representative or write direct to C. H. Wheeler of Philadelphia for complete information.

Wheeler "Tubejet"® Booster Ejectors withdraw vapors at high vacuum, and discharge them to a lower vacuum in the condenser. Air and non-condensable vapors are removed from the condenser by a two-stage Wheeler "Tubejet".

Process Equipment Division

C. H. Wheeler Mfg. Co.

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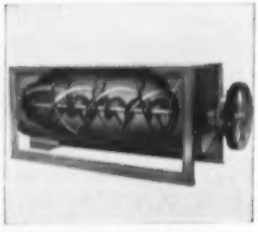
Philadelphia 32, Pennsylvania

Vacuum Equipment • Centrifugal, Axial and Mixed Flow Pumps • Steam Condensers • Marine Auxiliary Machinery • Nuclear Products

NEW PRODUCT NEWS

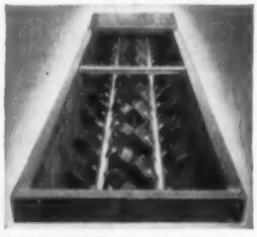
NEW HIGH SPEED MIXER FOR QUALITY FINISHING

The Turbulizer produces a homogeneous mix, increases production while reducing mixing time and costs.



TRIPLE ACTION MIXER—Complete uniform blending in 2 to 7 minutes.

STRONG-SCOTT TRIPLE ACTION MIXER exposes each particle in the mixture to over 10,000 separate mixing actions per minute as it blends and folds. This produces a uniformly mixed product with 99.9% thorough distribution of minor additives.



TWIN ROTOR MIXERS—Accurate blending of liquids and dry mix at any speed.

TWIN ROTOR MIXERS are designed primarily for high percentages of liquid application to light weight ingredients, where product identity is to be maintained. A double shaft assembly with overlapping, adjustable paddles gently combine the liquids with the dry mix.

STRONG-SCOTT TURBULIZER

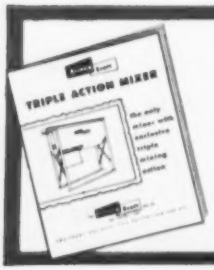
Provides Fast, Thorough Dispersion, Disintegration and Blending of Dry Materials, or Pastes Involving Liquids and Solids.

The TURBULIZER is a high speed, continuous mixer that will disintegrate and disperse fat pellets, chemical ingredients which have a tendency to ball or agglomerate, and other ingredients which can be broken by the paddles and thoroughly dispersed in the mixture. Product uniformity is accurately maintained as a result of high speed centrifugal forces created by the paddles.

It is also highly applicable where a fluffing action is desired on powdered material. Minor percentages of liquid may easily be added to dry mix with high efficiency and dispersion results.

The TURBULIZER is self cleaning and is built with sanitary seals at each end of the shaft. The interior is precision machined. Overlapping, adjustable paddles turn within a close tolerance to the chamber wall, providing a selective rate of material flow.

The TURBULIZER may be furnished in carbon or stainless steel and may be jacketed for hot water, steam or a refrigerant. Capacities will vary depending on the bulk density of the material and the degree of agglomerates encountered. Consult Strong-Scott for full details.



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The **Strong Scott** Mfg. Co.

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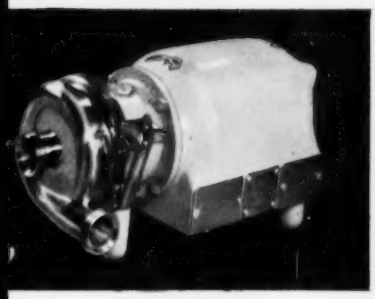
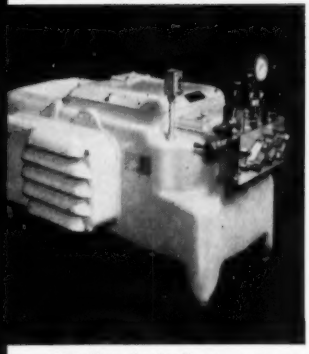


"Flexflo" Pumps. Complete line of centrifugals, in polished 316 stainless and unpolished finish. Capacities from 2,000 through 210,000 lb. hr.; ¼ h.p. to 30 h.p. WRITE FOR BULLETIN G-524.

"Superplate" Heat Exchangers for continuous, closed-circuit heating, cooling and regenerating. Electropolished knob-type plates of either 304 or 316 stainless. WRITE FOR BULLETIN G-515. Wide range of capacities available.

with this CHERRY-BURRELL equipment ...corrosion, flow control and heat transfer pose no problems



"Stellar Series" Superhomo Homogenizers. Single and two-stage Stellite homogenizing valves with replaceable valve caps of 18-8 stainless. Nine models from 50 to 5,000 g.p.h. WRITE FOR BULLETIN G-517.

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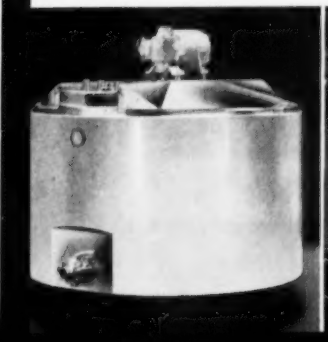

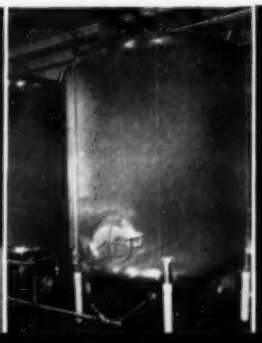

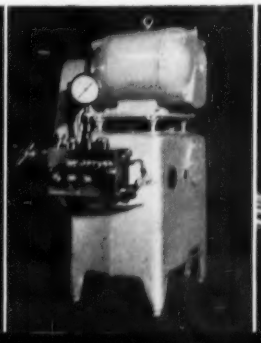

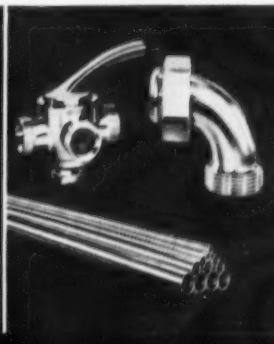

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Strides in Food Preservation

THE FUTURE OF FOOD PRESERVATION *edited by S. C. Lechtman and O. Fanning. Published by Midwest Research Institute, Kansas City, Mo. 1957. 192 pages, paper. Price: $6.*

Collected here are the proceedings of a symposium held by the Midwest Research Institute in April of this year. This was the organization's first meeting on food.

Papers included in the book cover refrigeration and freezing, dehydrofreezing, dehydration, heat preservation, "high energy" preservation, chemical preservation, techniques for improving research, economics of food processing methods, future methods of nutrition and food preservation, effects of preservation on consumer.

A "must" for the food management man who wants to keep abreast of the newest developments, the book provides the answer to a number of current questions on developments in the field.

Maintenance, Engineering

TECHNIQUES OF PLANT MAINTENANCE AND ENGINEERING 1957. *Published by Clapp & Poliak, Inc., 341 Madison Ave., New York City 17. 1957. 273 pages, cloth. Price: $10.*

Eighth in an annual series, this volume reports on the changing patterns of maintenance and engineering through 29 papers presented at the Plant Maintenance and Engineering Show. In addition to the reports, 890 specific problems are covered in question and answer form.

Illustrated with charts and graphs, the papers cover a wide range of topics. Most of these are applicable to all branches of industry, though a few deal specifically with food.

Dairymen's Reference

DAIRY BACTERIOLOGY (*Fourth Edition*) *by B. W. Hammer and F. J. Babel. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York City 16. 1957. 614 pages, cloth. Price: $9.*

Brought up to date to include the newest advances in the field, this fourth edition of a standard and popular reference work offers:

- A new chapter on bacteriology of milk production, with farm milk tanks and pipeline milkers.
- Discussion of various new bactericides.
- Expanded chapter on milk enzymes.
- Added data on psychrophilic bacteria.
- New chapter on the freezing of milk and cream.

The first ten chapters deal with processing. The last ten are primarily concerned with bacteriology of manufactured products.

Briefing Management Men

ACCOUNTING FOR NON-ACCOUNTANTS *by John N. Myer. Published by New York University Press, Washington Square, New York City 3. 1957. 235 pages, cloth. Price: $5.*

The growing complexity of modern business makes it necessary for the modern management to have an understanding of all phases of the company or corporation operation. This book, as its title implies, is designed to provide the executive with a broad view of accounting procedure, methods, and the place the accounting step occupies in today's business.

Oddly enough, Professor Myer admits to the cry of the management man who says that accounting is not a science and that it is not always a means to a precise conclusion. But the author does hold that accounting is an art, an important one.

The Spud and You

AMERICAN POTATO YEARBOOK 1957. *Published by American Potato Yearbook, 8 Elm St., Westfield, N. J. 1957. 80 pages, paper. Price: $2.*

This latest edition of the Potato Yearbook is packed with facts and figures of interest to the potato grower, shipper, jobber, research specialist, and others concerned with the Solanum tuberosum.

Information is offered on U. S. standards, as well as potato statistics from 1919 to 1955. An onion supplement supplies limited data.

Food Men and The Bomb

THE EFFECTS OF NUCLEAR WEAPONS *Edited by Samuel Glasstone. Published by U. S. Atomic Energy Commission. Available from Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. 1957. 579 pages, paper. Price: $2.*

American management is deeply concerned with the problems which would arise from nuclear warfare. This is particularly true of the food industry, with its indispensibility.

This complete and informative manual provides the food plant man with a key to effective defense measures for both plant and personnel. Aimed specifically at Civil Defense organizations, the book details the physical phenomena associated with nuclear explosions, with particular emphasis on the results of test explosions in the U. S.

Special segments cover the problem of food contamination and protection from radiation.

Booklets and Reports

CHEMISTRY OF NATURAL FOOD FLAVORS. *Published by Quartermaster Food and Container Institute for the Armed Forces, Chicago 9. 1957. 200 pages. No charge.* Report on proceedings of a recent symposium.

SHOULD THE WAGE-HOUR LAW BE REWRITTEN? *Publish by California Personnel Management Assn., Berkeley 4, Calif. 1957. 9 pages. $1.* Stenographic brief of address made by Newell Brown, U. S. Dept. of Labor.

LOGISTIC AND ECONOMIC FEASIBILITY STUDY ON RADIATION STERILIZATION OF FOODS. *Published by U. S. Dept. of Commerce, Washington 25, D. C. 1957. 125 pages. Price: $3.25.* Survey of all radiation equipment and facilities available in sizes large enough to be effective in large-scale processing.

FLUME SYSTEMS FOR HANDLING BULK-STORED POTATOES. *Published by USDA, Washington, D. C. 1957. 16 pages. Price: $.15.* Report on research at Red River Valley Potato Research Center, Minn.

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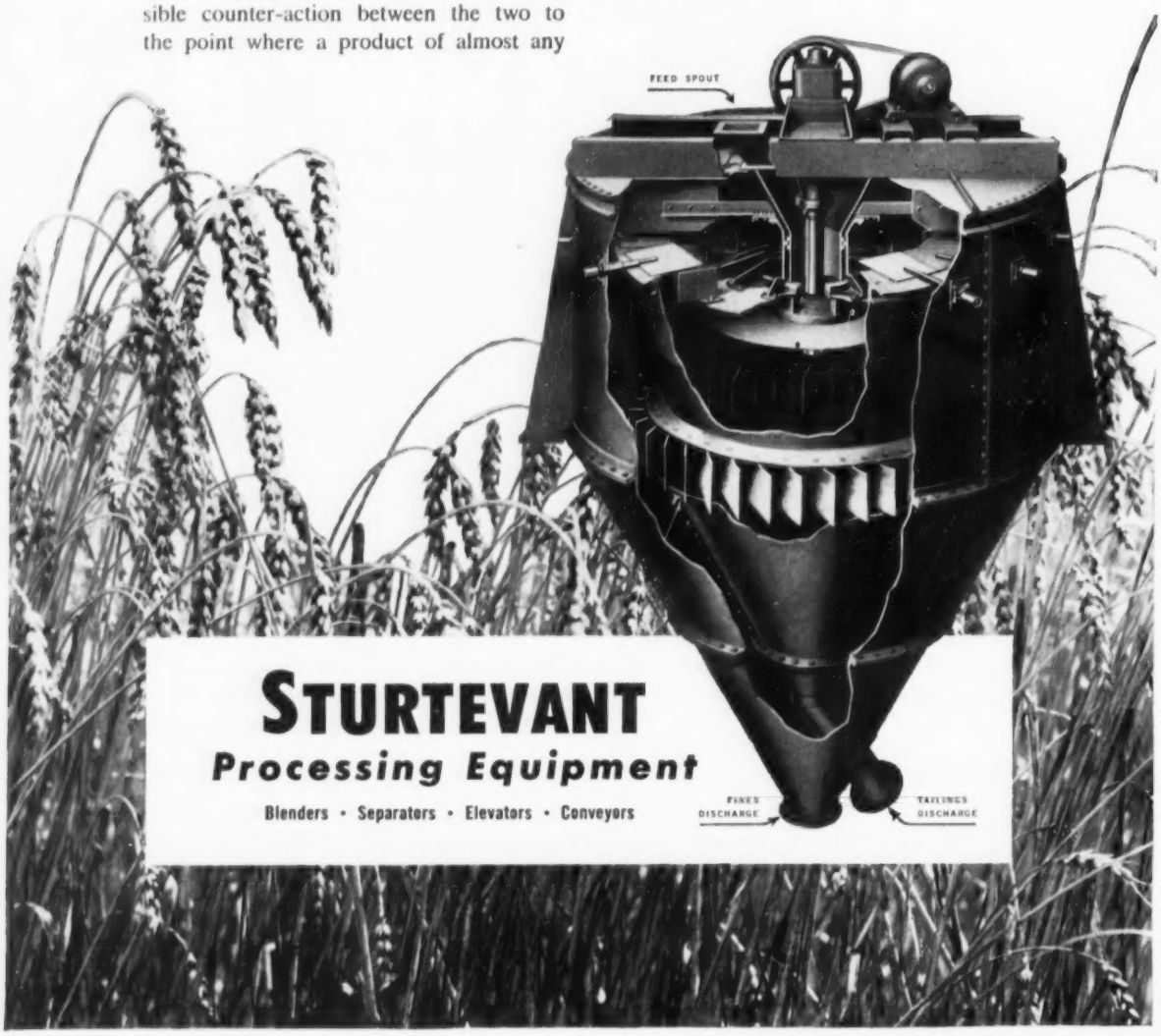

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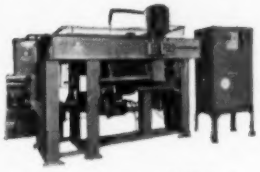

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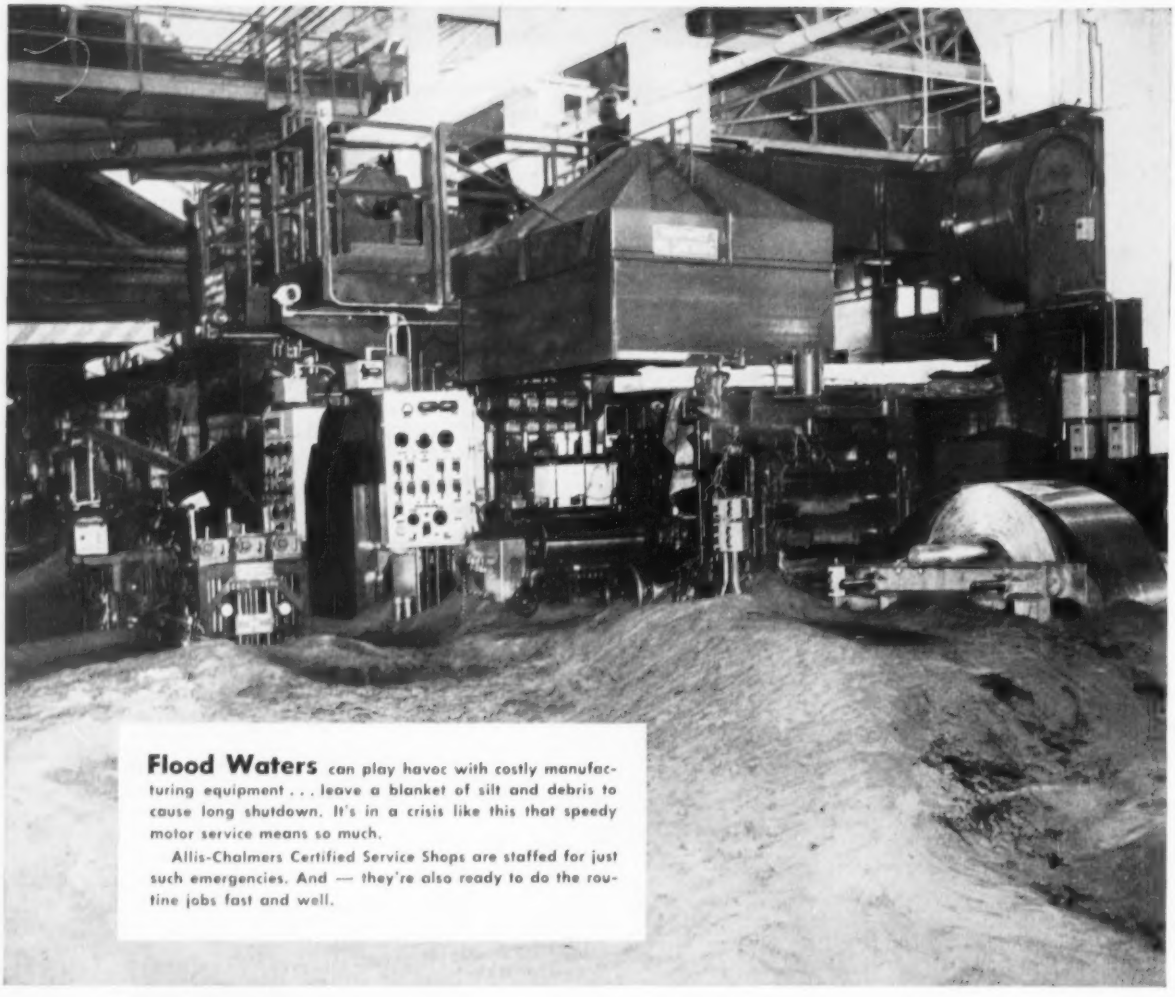

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RECENT INVENTIONS

PRODUCTS

Confectioners Coating Including Vegetable Fat High in Lauric Acid, Cocoa Powder, Alkali-N-Lauroyl Sarcosinate to Prevent Off-Flavors.—F. P. Colten, Roxbury and H. R. Di-Pietro, Watertown, Mass. to General Foods Corp., White Plains, N. Y. No. 2,796,349. June 18, 1957.

Vitamin Product Containing Fish Liver Oil, Butter Oil, Rice Bran Oil.—G. W. Campbell, Lynbrook, N. Y. No. 2,797,185. June 25, 1957.

Prepared Dessert Having Pudding Base, Cake-like Covering, Thin Sugary Crust.—E. B. Patterson, Minneapolis. No. 2,798,813. July 9, 1957.

Want more information on any of these recent patents—if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

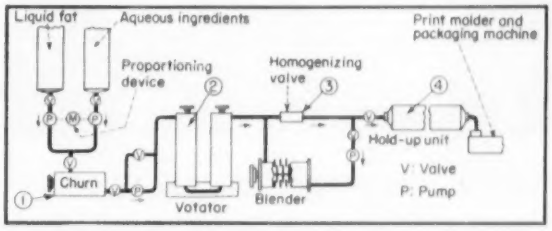
Frozen Patties Mixed With Gel-Forming Colloid.—E. I. Rivoche, Washington, D. C. No. 2,798,814. July 9, 1957.

Egg-Shell Candy Lined With Gum-Arabic and Ethyl Alcohol, Filled With Confectionary.—F. L. Webb, San Francisco and R. A. Conrad, Richmond, Calif. No. 2,800,409. July 23, 1957.

PROCESSES

Preserving Food by Contacting With Dextran and Antibiotic Solution.—L. J. Novak to Commonwealth Engineering Co. of Ohio, Dayton. No. 2,790,720. Apr. 30, 1957.

Replacing Sodium in Milk with Potassium Ions From Potassium Cation Exchange Resin, Replacing Calcium by Using Calcium Cation Exchange Resin.—C. C. Loo, Sepulveda, Calif. to Carnation Co., Los Angeles. No. 2,793,953. May 28, 1957.



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Process for margarine manufacture comprising following steps: (1) Emulsifying liquid fat and aqueous ingredients, (2) chilling emulsion to form a supercooled slurry stream in which crystallization is initiated, (3) blending stream with portion of recycled slurry which has been worked mechanically, (4) completing crystallization under quiescent conditions.—R. J. McGowan and R. A. Burt, Toronto, and B. F. Teasdale, Weston, Ontario, Canada, to Canada Packers, Ltd., Toronto. No. 2,797,164. June 25, 1957.

Providing Food With Protective Dextran Film by Contacting With Aqueous Dextran Dispersion.—H. A. Toulmin, Jr. to Commonwealth Engineering Co. of Ohio, Dayton. No. 2,790,721. Apr. 30, 1957.

Converting Bixin to Yellow Food Color by Heating With Lower Aliphatic Monocarboxylic Acid and Acid Anhydride.—A. J. Buzas, Easton, J. M. Dusinski, Nazareth, and R. T. E. Schenck, Bangor, to Keystone

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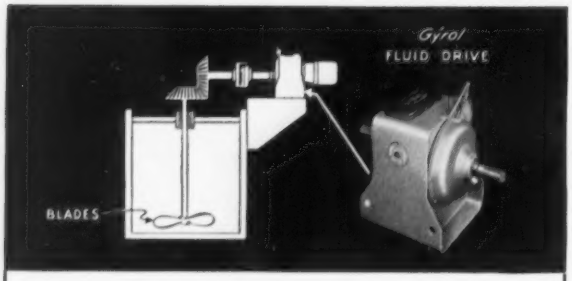

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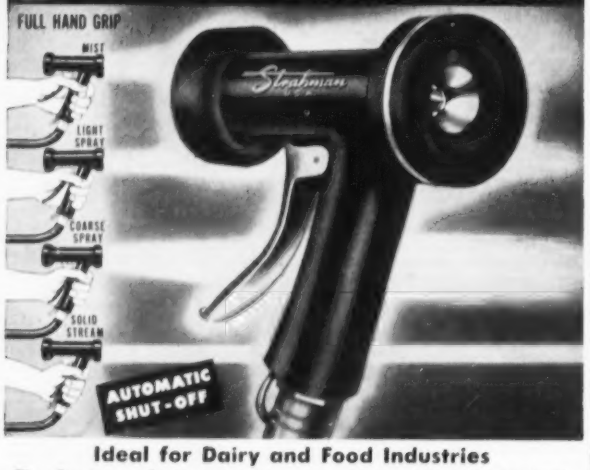

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STRAHMAN VALVES, INC., 18 HUDSON STREET, NEW YORK 13, U. S. A.

Chemurgic Corp., Bethlehem, Pa. No. 2,793,124. May 21, 1957.

Inhibiting Citrus Juice Spoilage by Introducing Organism Inhibitor Gas Into Atmosphere Above Juice.—H. J. Keller, Dunelin, to Brogdex Co., Orange County, Fla. No. 2,793,125. May 21, 1957.

Preparing Crispy Fried Foods by Steps of Dispersing Finely Divided Foods in Thixotropic Semi-gel, Subjecting to Action of Free Alkaline Earth Metal Ion, Frying.—No. 2,791,528. May 7, 1957.

Applying Firmly Adhered Non-Sticky Edible Protective Coating to Confectionery by Dissolving Zein and a Plasticizer in Organic Solvent, Applying to Product.—H. B. Cosler, Evanston, Ill. No. 2,791,529. May 7, 1957.

Retaining Color of Alimentary Paste Products by Combining Flour and Enriching Chemicals in Dry, Powdered Stream, Exhausting Air, Continuously Mixing With Liquid, Extruding.—N. Paven, Padua, Italy to Senvani Machine Co., Lowell, Mass. No. 2,792,304. May 14, 1957.

Improving Color of Discolored Cured Meats by Enclosing in Cold Sealed Room at Least Six Weeks.—R. H. Harper, Forest Park, Ill. to Swift & Co., Chicago. No. 2,792,305. May 14, 1957.

Forming Emulsion of Cured Sausage and Water, Drawing Vacuum, Then Agitating to Improve Color.—R. H. Harper, Forest Park, Ill. to Swift & Co., Chicago. No. 2,792,306. May 14, 1957.

Preparing Dried Egg White by Adjusting pH, Inoculating with *Saccharomyces Cerevisiae*, Fermenting, Spray Drying.—R. H. Forsythe, Park Forest, and R. W. Kline, Oak Lawn, Ill. to Armour & Co., Chicago. No. 2,796,352. June 18, 1957.

Forming Cheese Slices Using Frames Having Open Bottoms and Tops, by Depositing Fluid Cheese in Frames, Chilling, Opening Bottoms, Ejecting.—B. T. Hensgen and J. C. V. Bosch, to Swift & Co., Chicago. No. 2,799,586. July 16, 1957.

Producing Color-Bodies From Fresh Vegetables by Disintegrating, Extracting With Water, Separating Juice, Adding Plaster of Paris to Juice, Making Alkaline, Removing Liquid. E. C. Todd, Malibu, Calif. No. 2,799,588. July 16, 1957.

Drying Grain Without Affecting Germination Quality by Vacuumizing, Cooling, Condensing Moisture from Removed Air, Reheating and Returning Air to Grain.—R. Elwess, Minneapolis. No. 2,799,947. July 23, 1957.

Producing Citrus Molasses by Extracting Unbound Water With Lime, Flash Evaporating, Separating Lime Salts From Resultant Liquor, Freezing Out Solids, Washing With Organic Solvents.—E. B. Offutt, and H. A. Toulmin, Jr. to Commonwealth Engineering Co. of Ohio, Dayton, Ohio. No. 2,800,407. July 23, 1957.

Removing Cooked Tissue From Surfaces of Peeled Potatoes by Immersing in Lye Up to 10 Min., Washing.—W. O. Harrington, Berkeley, Calif. to USDA. No. 2,797,165. June 25, 1957.

Dehydrating Raw Potatoes by Immersing In at Least 2% Brine About 2 Hr. to Remove 21 to 28% Moisture.—J. Siciliano, Woodbury, N. J., E. E. Heisler, Plymouth Meeting, Pa., and R. H. Treadway, Philadelphia to USDA. No. 2,797,166. June 25, 1957.

Producing Dextrose Liquors by Hydrolyzing Starch With Acid, Adjusting pH, Filtering.—J. B. Gottfried, Chicago, W. K. Luby, La Grange, Ill., and W. B. Newkirk, San Diego, Calif., to Corn Products Refining Co., New York City. No. 2,797,176. June 25, 1957.

Improving Cured Color of Meat Products by Vacuumizing After Contacting With Enediol Containing Compound.—R. J. Praizler, to Swift & Co., Chicago. No. 2,797,998. July 2, 1957.

Manufacturing Starch and By-Products From Tubers by Steps of Comminuting, Treating in Countercurrent Hydrocyclone, Withdrawing By-Product-Free, Starch-Rich Faction From Final Stage, and Starch-Poor Fraction From First Stage.—F. J. Fontein and C. Dijksman to Stamicarbon N. B., Heerlen, Netherlands. No. 2,798,011. July 2, 1957.

Inhibiting Micro-Biological Growth in Beer by Incorporat-

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ing Antibiotics Polymyxin and Thiolutin.—J. B. Bockelman, Tenafly, and F. B. Strantskov, Verona, N. J. to Schaefer Brewing Co., Brooklyn, New York. No. 2,798,811. July 9, 1957.

Prolonging Color of Fresh Meat by Treating With Antibiotic and Ascorbic Acid Compounds.—A. L. Savich, Chicago, and C. E. Jansen, Palos Heights, Ill., to Swift & Co., Chicago. No. 2,798,812. July 9, 1957.

Preparing Granular Potato Products by Cooking, Dry-Heating, Cooling, Kneading, Shaping, Drying, Crushing.—A. Medriczky to "Potagrain Foods" Refining Corp., Inc., New York City. No. 2,798,815. July 9, 1957.

Drying Onion-Slices by Passing Hot Gas Through Layer of Uniform Thickness in Three Separate Steps.—J. F. Scott, Oreland, Pa. to Procter & Schwartz, Inc., Philadelphia. No. 2,799,096. July 16, 1957.

Producing Bone-Free Meat and Poultry by Cooking, Comminuting While Hot, Adding Liquid, Centrifuging.—A. N. Robertson, Atlanta, Ga. No. 2,799,584. July 16, 1957.

Molding Comminuted Meat Products by Extruding in Rod Form, Abruptly Reducing Diameter.—B. T. Hensgen and H. G. Reichel, to Swift & Co., Chicago. No. 2,799,585. July 16, 1957.

EQUIPMENT

Malting Apparatus Comprising Endless Carriers in Parallel Compartments, Ventilation Means.—C. P. Melligan, Deerfield, Ill. to Albert Schwill & Co. No. 2,792,644. May 21, 1957.

Baking-Oven Including Baking Chamber, Gas Burner, Flue Passage.—W. C. Agnew, Brighton, N. Y. No. 2,792,793. May 21, 1957.

Gizzard-Cutter Having Throat Flangs for Guiding Gizzards Under Hold Down Plate. Across V-Shaped Trough, and Over Cutting Disk.—J. M. Littjohann, Wheat Ridge, Colo. No. 2,793,391. May 28, 1957.

Poultry Deboning-Tool Having Semi-Ovate Cross Section Containing Slot.—D. Cutrera, San Francisco. No. 2,793,392. May 28, 1957.

Fowl-Dehcading Machine Utilizing Conveyor Having V-Shaped Fingers, Rotating Cutter. Severed Head Baffle, and Ejector.—E. Fosdick, Fairbury, Ill. No. 2,793,393. May 28, 1957.

Meat-Patty Forming Machine Having Supply Means, Rotatable Apertured Forming Plate, Discharge Plunger.—C. A. Menkens, Winchester, and R. C. Stevenson, Sutherlin, Oregon. No. 2,793,394. May 28, 1957.

Continuous Cooker Comprising Body, Horizontal Worm, Throttling Means, Steam-Heating Jacket, Strainer Plate and Juice Discharge Pipe. — W. Rothe, Hamburg, F. Schroder, Rinteln (Weser), and C. Wildhagen, Braunschweig-Wendhausen, Germany to Braunschweigsche Maschinenbauanstalt A.G. No. 2,793,582. May 28, 1957.

Dough-Former Having Cammed Means for Varying Dimensions of Dough Opening.—E. J. Rivoche, Washington, D. C. No. 2,793,598. May 28, 1957.

Brussel Sprouts Butt-End Remover Employing Circular Row of Holders Supported by Rotating Table, Rotary Cutter.—V. E. Pinard to Richmond-Chase Co., San Jose, Calif. No. 2,793,665. May 28, 1957.

Potato-Grater Composed of Base, Hinged Cover, Rotary Drum Formed With Teeth.—A. Scheiner, Bronx, N. Y. No. 2,793,666. May 28, 1957.

Fruit Orienting Mechanism Employing Support, Belt Having Raised Spaced Fruit Support Cups, Means for Releasing Fluid Under Pressure Into Cups.—C. Lorenzen, Davis, Calif. to University of California, Berkeley. No. 2,793,734. May 28, 1957.

Potato and Debris Sorting Device Comprising Belt System and Wash Means.—W. B. Pridy, Long Beach, Calif. No. 2,793,747. May 28, 1957.

Grain-Cleaning Machine Utilizing Elevator, Screen, Grain and Chaff Receivers.—W. E. Wiesenthal, Wichita, Kans. No. 2,793,749. May 28, 1957.

Food Dispenser Employing Rotary Wheel to Deliver Timed Charges.—C. A. Clark to W. M. Holt, Lompoc, Calif. No. 2,793,791. May 28, 1957.

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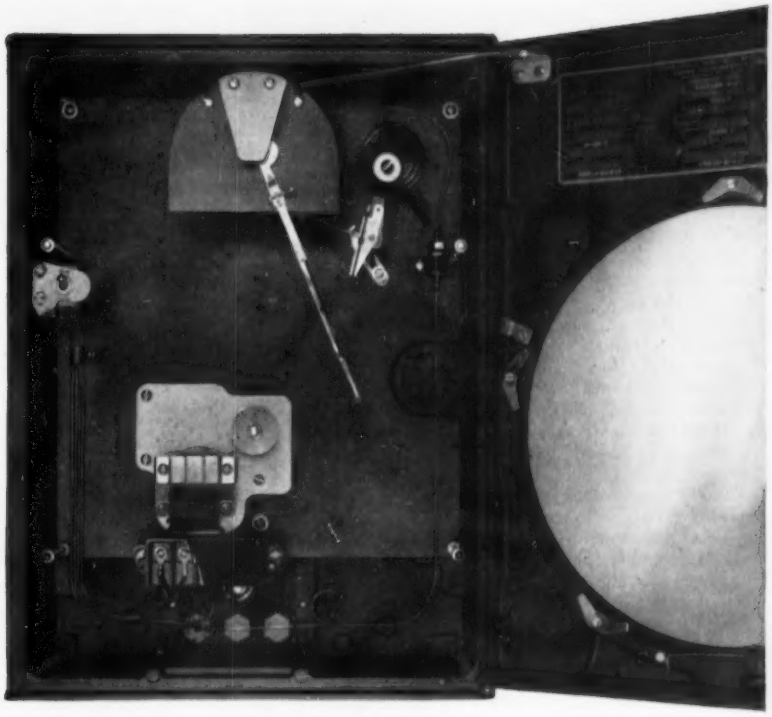

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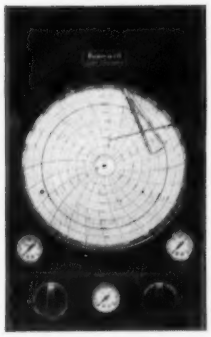

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spice RESEARCH NEWS

New Test for Judging Quality in Natural Black Pepper

A new, modified colorimetric procedure for determining quality in pure, natural black pepper has been developed. Based on the piperine content of the spice, the new test provides a more accurate, simpler and faster way of gauging the quantity of piperine present than previous techniques. Piperine, the substance associated with pungency and bite strength in pepper, is measured by color developed with special reagents. This test, coupled with a recently developed method of analyzing volatile oil, the aromatic factor in black pepper, makes it possible to measure more accurately the flavor of the spice.

This is one of many new developments in the spice trade's current program of research on natural spices. New facts are steadily making it more apparent that the pure, natural spices offer the modern food manufacturer flavor performance not obtainable from any other flavoring materials.

— • —

MORE DETAILS . . . on the new Piperine Test for Natural Black Pepper are available from the Information Bureau, American Spice Trade Association, 350 Fifth Avenue, New York 1, N. Y.

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plying Flavoring Material.—V. E. Painter, Newton, Ia. to Dairy Queen Co., Mexico, Mo. No. 2,793,838. May 28, 1957.

Shrimp-Deheader Employing Fan to Draw Shrimp From Table Into Contact With Lower Run of Feeder Belt, Before Chuting to Conveyor With Deheading Means at Its Terminus.—J. L. Self, Lake Charles, La. No. 2,794,209. June 4, 1957.

Sausage Stuffing Machine Utilizing Power Piston for Ejecting Contents Through Outlet.—J. J. Opiekon, Chicago. No. 2,794,210. June 4, 1957.

Can-Cooler Housing Having Cooling Zones, Conveyor, Coolant Recirculation Means.—S. A. Mencacci, to Food Machinery & Chemical Corp., San Jose, Calif. No. 2,794,326. June 4, 1957.

Freeze-Drying Apparatus Employing Enclosed Tank, Refrigerant Tubes, Scraper Means.—E. P. Wenzelberger to Commonwealth Engineering Co. of Ohio, Dayton, Ohio. No. 2,794,327. June 4, 1957.

Can Pressure-Cooker Comprising Cooking and Cooling Chambers Connected Via an Air Lock, First Chamber Has Liquid of Specific Gravity Lower Than Cans, and Second is Higher Than Cans.—D. H. Ingham, Omaha, Nebr. No. 2,794,385. June 4, 1957.

Ice Cream Sandwich Machine Employing Improved Means for Separating, Comprising a Pocketed Conveyor.—E. J. Rapp, Toledo, Ohio to Lynch Corp., Anderson, Ind. No. 2,794,404. June 4, 1957.

Molasses Spray-Nozzle Formed of Cylindrical Passages and Needle Valve.—W. E. Michaels, Bethlehem Center, N. Y. to Industrial Molasses Corp., Leonia, N. J. No. 2,794,683. June 4, 1957.

Lard-Renderer Temperature Sensing Means Having Layer of Shock Absorbing Heat-Insulating Material Lying Against Inside Wall, Small Resistance Tab on Insulation, Protective Metal Plate Covering Tab.—L. J. Pircon, Berwyn, Ill. to American Meat Institute Foundation, Chicago. No. 2,795,139. June 11, 1957.

Coffee-Roaster Employing Top and Bottom Located Infra-Red Lamps.—A. Scolari, Milan, Italy. No. 2,795,181. June 11, 1957.

Vegetable-Peeler Combining Cylindrical Chamber With Perimetral Abrading Surface, Rotator, Baffles.—R. A. Coleman and L. H. Long to J. D. Ferry Co., Harrisburg, Pa. No. 2,795,253. June 11, 1957.

Bread-Slicing Blade Constituting Endless Band With Parallel Ground Cutting Edge.—J. Hansen, Bettendorf, Iowa. No. 2,795,255. June 11, 1957.

Meat-Block Unmolding Unit With Mold Cover Remover, Air-Pressure Means.—J. B. Lubischer, Rochester, N. Y. to Allbright Nell Co., Chicago. No. 2,795,344. June 11, 1957.

Fish-Descaler Employing Leaf Spring to Force Fish Against Descaler Rolls.—S. M. Godfrey, Sharon, Pa. No. 2,795,812. June 18, 1957.

Poultry-Dressing Machine Comprising Support, Probe, Cylindrical Cutter Blade Mounted Coaxially to Probe.—J. H. Dahlberg to C. A. Swanson & Sons, Omaha, Nebr. No. 2,795,815. June 18, 1957.

PACKAGING

Beverage-Case Hand-Grip Consisting of Oblong Oblique Holes in Paper Board Material.—D. E. Kessler, Cincinnati. No. 2,788,933. Apr. 6, 1957.

Cap Inspecting Unit That Rotates Caps in Front of Inspection Light, Photocell Positioned to Collect Light Reflected From Cap, Electro-responsive Means to Remove Caps Without Liners.—R. W. Meyer, Elgin and R. G. Swanson, Dundee, Ill. to Owens-Illinois Glass Co. No. 2,793,746. May 28, 1957.

Forming a Confection Package by Shaping Pair of Thermoplastic Sheets Over Metal Molds, Cooling, Filling With Molten Confection, Fitting Plastic Sections Together.—E. Feinstein, New York City. No. 2,796,033. June 18, 1957.

Tape Applying Unit for Inner and Outer Faces of Can Side Seams Employing Tape and Can Advancing Means.—A. Honkanen, Barrington, Ill. to American Can Co., New York City. No. 2,795,263. June 11, 1957.

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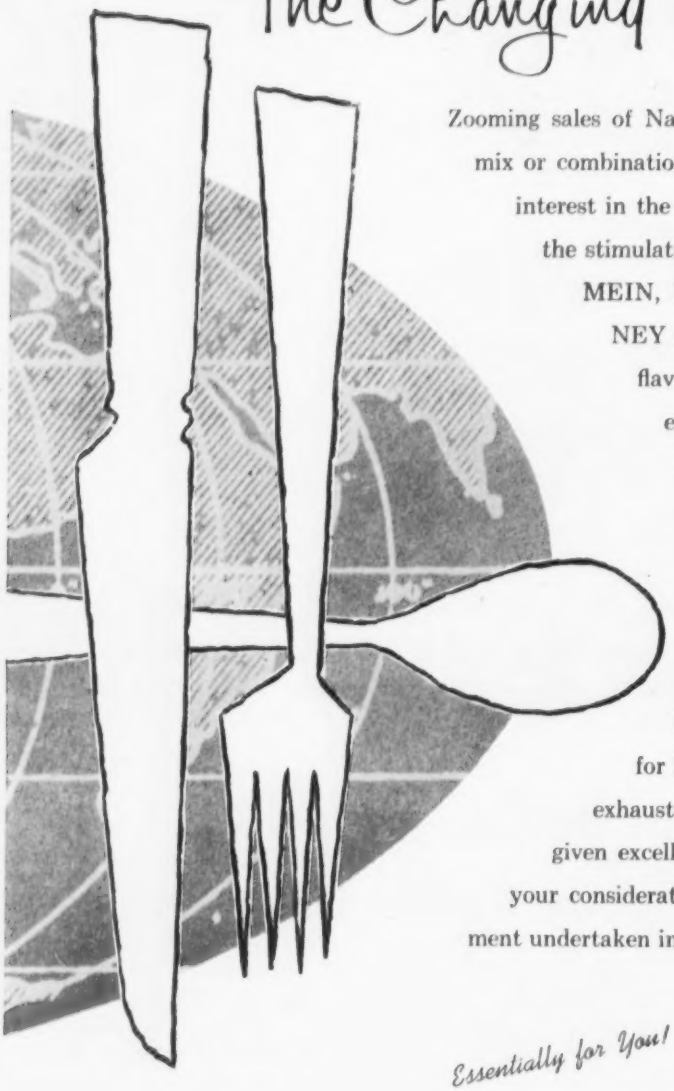

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Circuit Between Two Electrodes, Baffle Cylinder.—H. Edel, Arlington Heights, Ill., to Bowman Dairy Co., Chicago. No. 2,792,680. May 21, 1957.

Filling and Closing Machine Adapted to Handle Cartons Containing Strips of Containers, Including Unloading Station, Filler, Sealer, Loading Station.—P. F. Gilberty, Roslyn Heights to Dairymat Corp., Long Island City, N. Y. No. 2,792,681. May 21, 1957.

Dough Package Constructed With Inner Fibrous Cylindrical Body Having Helical Separation Line, Readily Detachable Outer Wrapper, End Closures.—W. F. J. Fienup, St. Louis, Mo., H. W. Putnam, Jeffersonville, Ind., and R. A. Easter, Minneapolis to R-C Can Co., St. Louis. No. 2,793,126. May 21, 1957.

Confection Packaging Unit Combining Step-by-Step Carton Conveyor, Cup Dispenser Mechanism, Filler Devices, Capping Means.—W. M. Rich, West Palm Beach, Fla. No. 2,796,711. June 25, 1957.

Beverage Container Having Upwardly Converging Front and Rear Top Walls, Pouring Openings, Pull-Up Closure Tabs, Right Angle Hanger Member Holding Slideable Sipper Straw Inside Container.—W. A. Pugh, Sr., Chicago. No. 2,799,439. July 16, 1957.

Vacuum-Packaging by Steps of Enclosing Product, Vacuumizing, Preheating, Clamping Edges, Applying Fluid Pressure, Sealing Edges.—S. R. Grinstead, Whiting, Ind. and J. B. Hanner, Stockton, Calif. to Swift & Co., Chicago. No. 2,799,589. July 16, 1957.

Ice Cream Container End Closure Including Main Panel, Side Walls, Locking Flanges, Tear Strip.—M. J. Kelly to Waldorf Paper Products Co., St. Paul, Minn. No. 2,800,366. July 23, 1957.

Preventing Adhesion of Foods to Inner Surfaces of Container by Applying Cycloimidine Compound.—A. C. Edgar, River Forest, Ill. and H. T. Spannuch, Chicago, to Wilson & Co., Inc. No. 2,800,410. July 23, 1957.

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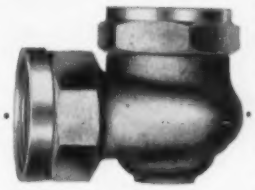

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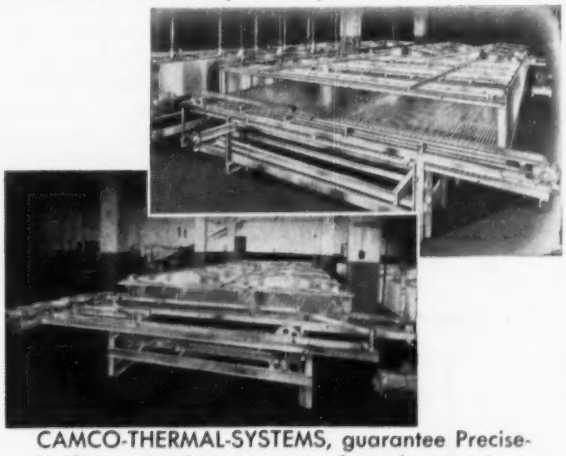

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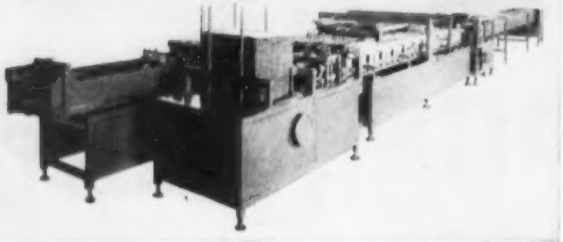

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Eighteen 7 & 8 oz. cartons in 20" x 14⅛" x 8⅛" case

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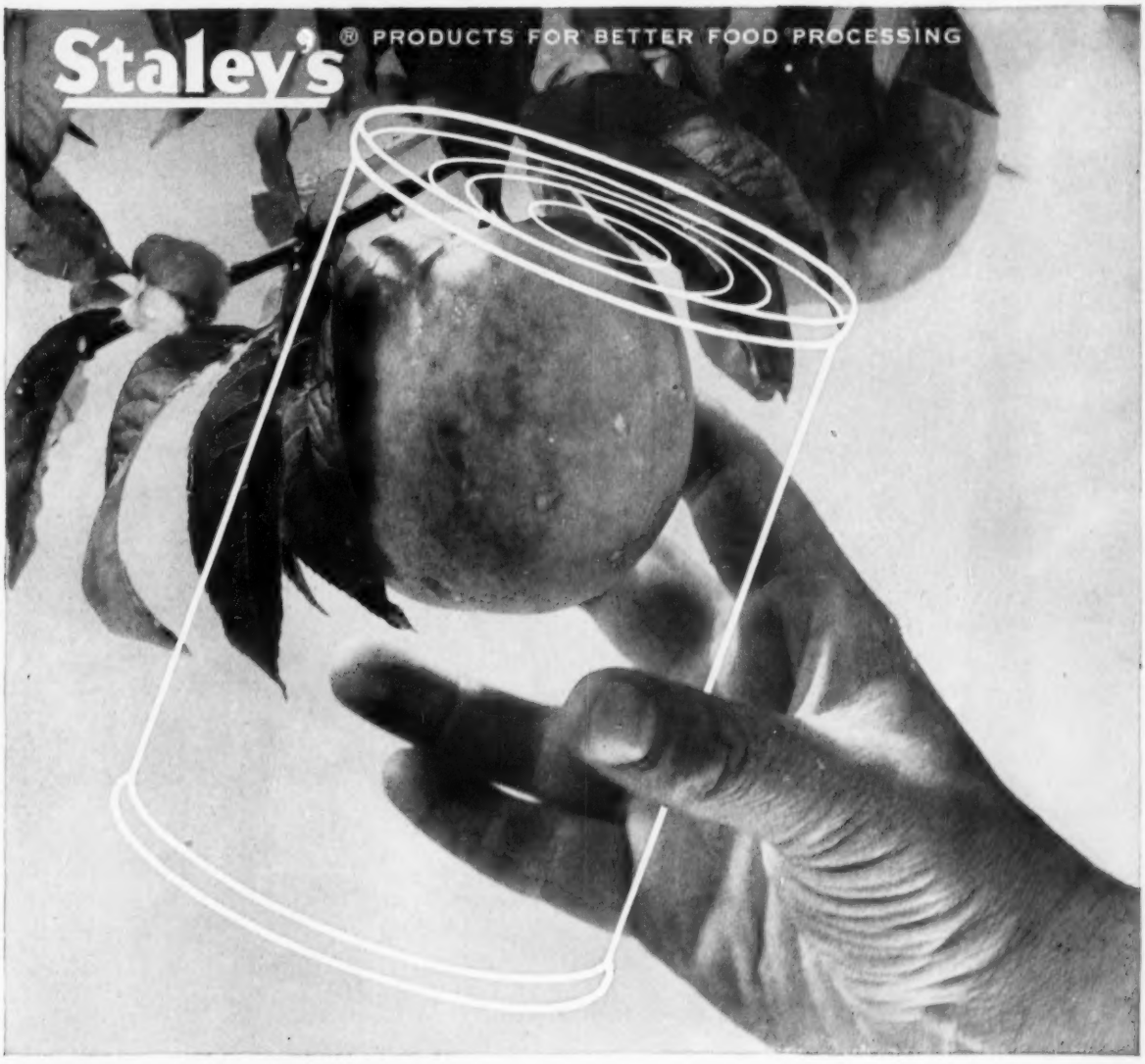
Twenty-four cartons in 19½" x 10⅛" x 7" case

Forty-eight cartons in 22¾" x 23½" x 15⅛" case



How to capture and hold natural fruit colors at their peak...*and keep them from "fading"*

Easy low cost way to give your brand that "fresh-picked" look —the kind Mrs. Consumer buys again and again and again

It's disheartening, isn't it? Disheartening to have those bright, mouth-watering colors of your highest grades—so eye-appealing when they were packed—become discolored by the time Mrs. Housewife serves them. And it's so unnecessary, too, thanks to Staley's Sweetose Enzyme Converted Corn Syrup.

For Sweetose holds maximum color . . . gives better gloss . . . retains the "sheen" that says *your product* was fresh picked. That's because Sweetose better protects the "natural pigments" in your red fruits . . . retards the oxidation of Vitamin C that causes "browning" . . . contributes other appetizing appearance factors as well.

Get *all* the facts. Learn how Sweetose and Staley's bulk handling system not only speeds production, cuts costs—improves flavor, body, quality—*but* steps up your sales by holding natural fruit colors. See your Staley Representative or write, wire or phone today.

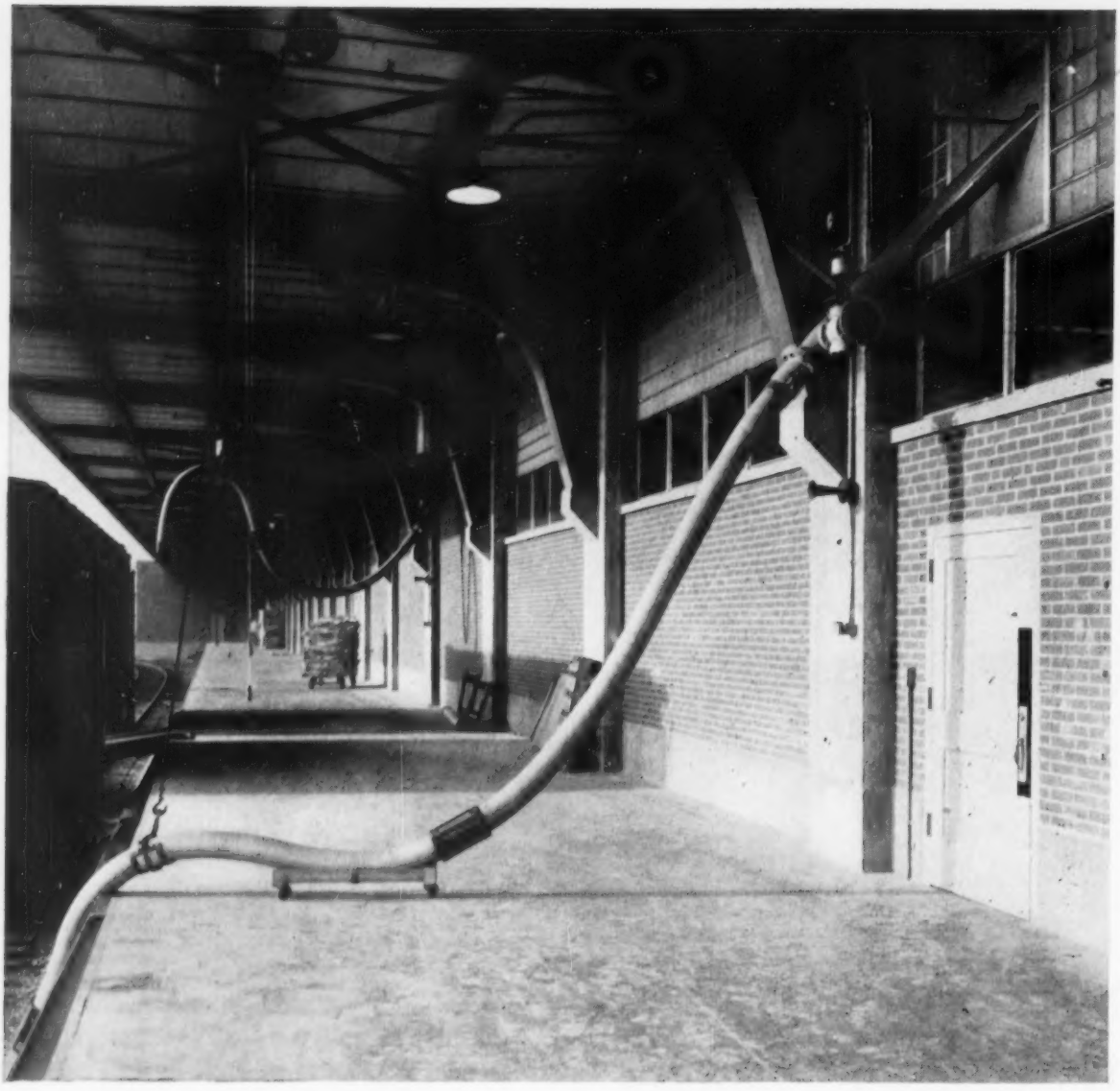
A. E. Staley Mfg. Co., Decatur, Ill.

PRODUCTS FROM CORN
Staley's
AND SOYBEANS ®

OTHER QUALITY PRODUCTS
Regular & Intermediate Corn Syrups
Canners Starches
Refined Corn Oil
Zest®, Monosodium Glutamate
Sta-Sol® Lecithin

Sweetose®
SYRUP

For more data, circle this page number on card at back →



SAVINGS FOR PROFIT . . . with FULLER

Because materials handling . . . however important in your daily operations . . . is a non-productive function, the best way to keep costs down is to install a conveying system best suited to your bulk handling requirements. A Fuller pneumatic system may be the answer—clean and efficient, requiring minimum attention and maintenance.

Fuller offers three basic systems to accomplish savings in handling dry pulverized and granular materials: Airveyor®, Fuller-Kinyon System, and Fuller Airslide®. Leading companies in your field, and many others, are using Fuller engineered systems to profit through important economies.

Fuller offers you more than thirty years of specialized experience in pneumatics. Write today for detailed information on Fuller Systems and unbiased materials handling advice.

FULLER COMPANY GENERAL AMERICAN

Fuller

. . . . pioneers in harnessing AIR

A-231
4658

FULLER COMPANY

114 Bridge St., Catasauqua, Pa.

SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION

Birmingham • Chicago • Kansas City • Los Angeles • San Francisco • Seattle

← For more data, circle this page number on card at back

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executives, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work
Civil Service Opportunities
Selling Opportunities Wanted
Selling Opportunities Offered
Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED ———**RATES**——— **UNDISPLAYED**

The advertising rate is $18.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

$7.50 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Positions Wanted—The rate is one-half of the above, payable in advance.

Box Numbers—counts as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS or Inquiries to Classified Advertising Division of FOOD ENGINEERING, P. O. Box 12, N. Y. 36, N. Y.
October issue closes September 26th.

WE NEED
FOOD TECHNOLOGISTS and
FOOD CANNING CANDIDATES
—junior to top-level

Call, write or wire:
Gladys Hunting (Consultant)
Drake Personnel, Inc.
220 S. State St., Chicago 4, Ill.
HArrison 7-8600

REPLIES (Box No.): Address to office nearest you
c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

EMPLOYMENT SERVICE

Salaried Personnel. $5,000-$30,000. This confidential service established 1927 is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F., P. O. Box 674, Manchester, Vermont.

POSITIONS WANTED

Young man, B.A. degree, 7 years in meat packing, broad background in production and sanitation, supervisory capacity, desires management position in food industry offering opportunity and challenge. Will consider foreign employment. PW-5780, Food Engineering.

Young production executive in foods processing, 15 years experience, seeks job as plant manager, or comparable position to more widely use abilities and background. PW-6032, Food Engineering.

Food Technologist desires position in sales and technical service to baking, confectionery, ice cream, etc. industries in New England area. Reply PW-5726, Food Engineering.

FOOD EXECUTIVE

Well-trained production executive with creative drive, BSc., age 35, offers these qualifications: 12 yrs. exp. in diversified food mfg. and pkg; exp. in food plant erections to production phase; product development and sales promotion. DESIRES food mfg., pkg., or allied line concern who offers potential in executive management. Write:

PW-6024, Food Engineering
68 Post St., San Francisco 4, Calif.

When Answering
BOX NUMBERS...

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

SALES MANAGER WANTED

Large Eastern Food Packer in need of National Sales Manager to handle complete sales of canned and frozen foods, concentrated and bottled juices, maraschino cherries and allied items. We have in mind a large expansion program and our goal is the doubling of our present sales volume. Duties would be to cover brokers and sales agents and act as Assistant to President.

Write state age, references, qualifications and salary desired.

P-6022, Food Engineering
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

BAKERY ENGINEER

Pennsylvania baking company has an opening for experienced Bakery Engineer. Will be responsible for building maintenance, equipment maintenance, plant layout, designing production processes and improving existing procedures. Direct supervision of approximately 25 men. Must have leadership ability.

This is an old established company, with excellent growth record and stability. Opportunity for advancement in a growing company.

Salary commensurate with experience and qualifications. Submit resume giving full details of experience and salary requirements in first letter. Replies will be held in absolute confidence.

P-6023, Food Engineering
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

FOOD CHEMISTS and MICROBIOLOGIST

A leading manufacturer of processed meats requires several people to staff its new laboratories (construction to be completed in September). Outstanding opportunities in research and quality control for the following positions:

- **FOOD TECHNOLOGIST**
- **FLAVOR CHEMIST**
- **MICROBIOLOGIST**
- **ANALYTICAL CHEMIST**

Experience in similar industry preferred, but not essential. This is an excellent chance to grow with a strong, medium-sized, rapidly expanding organization. Please forward complete resume and salary requirements to

PETER ECKRICH & SONS, INC.
Personnel Department
Box 299 **Fort Wayne, Indiana**

FOREMAN

Massachusetts food packaging plant has a good opening for a qualified foreman. Position offers rapid advancement for industrious, capable man. Preference given individual having experience in food processing. Salary arranged. Write stating experience and qualifications to

P-5975, Food Engineering
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

FOOD TECHNOLOGIST

Well established, rapidly expanding, Mid-Western firm packing salad dressings needs a Food Technologist. Opportunity for young man with or without experience to work in Quality Control and Product Development. Submit resume of education and experience, if any.

P-5993, Food Engineering,
520 N. Michigan Ave., Chicago 11, Ill.

PLANT MANAGER

Vegetable packaging firm located in the East. Unusual opportunity for energetic, capable young man to establish a future with a progressive organization. Must be qualified to assume production management and maintenance responsibilities. Salary commensurate with ability and experience. Write

P-5970, Food Engineering
Class Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

FOOD TECHNOLOGIST

Central Quality Control Department has openings for experienced bio-chemists and food technologists. Advancement opportunities in plant or staff quality control and production supervisory positions. Salary commensurate with experience. Send complete resume to:

Personnel Department
THE WELCH GRAPE JUICE CO., INC.
Westfield, New York

WHERE TO

- **STORE** Frozen Foods
- **BUY** Ingredients, Equipment, Parts, Services

SEARCHLIGHT SECTION

Classified Advertising

BUSINESS OPPORTUNITIES — EQUIPMENT - USED or RESALE

UNDISPLAYED ——RATES—— *DISPLAYED*

$1.50 a line, minimum 3 lines. To figure advance payment count 5 average words as a line. BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

The advertising rate is $13.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW ADS or Inquiries to Classified Advertising Division of Food Engineering, P. O. Box 12, N. Y. 36, N. Y. October issue closes September 26th.

CARROT OIL makes food golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A activity.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A activity of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET

New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitney, Ind.

QUAKER CITY COLD STORAGE CO., INC.
PHILADELPHIA, PA.
3 WAREHOUSE LOCATIONS
Proper Temperature for Frozen Foods

Just say:
"Information, please"

whenever you need products or services not advertised in a particular issue of this magazine.

Each issue is only part of the complete service we are organized and glad to render to reader and advertiser, alike. We want you to consider this publication your primary source of information in this field.

FOOD ENGINEERING
Classified Advertising
P. O. Box 12, New York 36, N. Y.

SPECIAL SERVICES

Laboratory Equipment Repair Co., 1810 W. Ogden, Chgo 12, Ill. AO-Beckman-B&L-Coleman-Klett-Leitz.

Rebuild those leaking valves!! Sanitary valves rebuilt for a fraction of the cost of a new valve. Prices submitted on request. Stuart W. Johnson & Co., 611 Main Street, Lake Geneva, Wis.

Instrument Repair. Temperature regulators, mercurial indicating thermometers and recording thermometers of all makes repaired. Complete satisfaction guaranteed. Stuart W. Johnson & Co., 611 Main Street, Lake Geneva, Wis.

Liquidating—Bargain Prices—
Complete Plant
Mayonnaise, Coffee Roasting. Pan Cake Flour Equipment.

QUAKER CITY PRODUCTS CO.
704 S. 6th St. Phila. 47, Pa.

Niagara Automatic Bag Filler & Sealer With bucket escalator feeding & counter. Best offer.
FS-5876, FOOD ENGINEERING
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

NEED OIL FREE AIR

FOR SALE—Gardner-Denver air compressor, Model RX, carbon ring type, cap. 120 cfm at 100 psi at 400 rpm, 20 HP, 60 cycle, 220 V. AC motor, completely factory rebuilt. Immediate delivery.

FS-5910, Food Engineering
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

NEW SHRIVER ALUMINUM FILTER
FOR SALE

Shriver filter press, 36" square, open delivery, 33 chamber plate and frame type of Alcoa alloy #43 aluminum; complete with all accessories, less pump.

FS-5909, Food Engineering
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Your Inquiries to Advertisers Will Have Special Value . . .

—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publishers to secure more advertisers and—more advertisers mean more opportunities or better service—more value—to YOU.

USED
VACREATOR WANTED

Capacity 10 to 20,000 lbs. per hour.

B. DESAULNIERS
1504 Davidson St.
Montreal, Que., Can.

WANTED
STEEL BOUND SKIDS
ABOUT 32" x 54"–7½" CLEARANCE.

W5934, Food Engineering
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

WANTED TO BUY
FUMIGATING CHAMBER
Standard Guardite Fumigating Chamber 5'6" Wide x 6'6" High x 15' Long or Larger.
Reply to
W-6008—Food Engineering
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

TANK TRUCKS FOR SALE
Six—1500/gal. Farm Pick up Tanks
Heil Tanks on Ford Trucks
Prices range from $3800 to $10,000 for complete unit.

Whatcom County Dairymen's Association
Box 157 Bellingham, Wash.

BOILERS

HI-PRESSURE
Complete stock from 10-2,000 h.p.
Nation's largest inventory, New & Used
WABASH POWER EQUIPMENT
31 E. CONGRESS, CHICAGO 5, HA 7-4855

FOR QUICK SALE
New "VORTEX" MIXER & KNEADER, 3 bbl.; revolving bowl on portable carriage. Heavy duty.
COPPER STEAM-JACKETED KETTLES, 35, 100 & 150 gal., 2" outlet, with valves and stands.
PRATER PULVERIZER, MODEL 6JS.
FITZPATRICK RIVING MACHINE MODEL 8 Type EC, for frozen eggs and cream.
ADSCO STEAM FLOW METER, orifice type.
New CREASY ICE BREAKER, cap. 8 tons per hr.
HENRY LABER & ASSOCIATES
123 Pitt St. New York 2, N. Y.

FOR SALE
New, low prices on
PLUNGER SEALS
For your C.P. and M.G. homogenizer. Send for trial offer. Advise style and capacity of homogenizer.
STUART W. JOHNSON & CO.
611 Main St. Lake Geneva, Wis.

Liquidation

TRENTON CHEMICAL CO.

TRENTON, MICHIGAN

1—Swenson Quadruple Effect forced circulation Evaporator 12,975 sq. ft.
1—Arnold 6′ dia. 316 S.S. Evaporator 325 sq. ft.
1—Harris 3′ dia. 316 S.S. Evaporator
3—American 42″x120″ double drum dryers.
3—Louisville 6′ dia. x 50′ rotary steam tube dryers.
7—5000, 3200, 2000. and 1200 gal. 304 S.S. tanks.
30—40,000, 30,000, 22,000, 12,000 gal. steel Tanks
1—Bird 18″x28″, 304 S.S. continuous Centrifuge
2—AT&M 42″ suspended, 304 S.S. Centrifugals
2—Tolhurst 40″ suspended, steel Centrifugals
36—Centrifugal & Rotary Pumps, Stainless, Olivite, Haveg & Iron, 1½″ to 4″.

Write or phone for detailed circular. Representative on premises.

BRILL EQUIPMENT COMPANY

2401 Third Av. New York 51, N. Y.
Cypress 2-5703
or
608 Harrison Av. Trenton, Michigan:
Orleans 6-5110

GO WEST FOR THE BEST

- 1—FMC Juice Processor, S.S. 4 unit, flg 4500
- 1—Sharples Super-D-Cantor PN-14 taper bowl
- 3—Tyler Hummer 3x5′ single deck S.S. Screens
- 2—Niagara Model 510-28 Filters, S.S. leaves
- 14—Syntron Spiral Vib. Elevators, 17′ lift
- 2—6½′x45′ Rotary Dryers, ⅛″ shell, hvy
- 3—Oliver 6′x6′ Vacuum Filters, salt type
- 1—Nash C-12 Air Compressor, 50 HP motor
- 1—Belt Conveyor 36″x136′, 7½ HP ghd drive
- 1—A T & M 42″ S.S. susp. Centrifuge, perf.
- 2—250 gal Lee S.S. Kettles, 100# jkt press
- 1—Glenn 340 qt AMF Vertical Mixer, hvy duty
- 4—Std. Knapp Model F Casers, 6 ounce—#2
- 1—FMC 55″ dia Cooker, cap 2338 #211 cans
- 1—M & S #10 Filler, 6 pistons, bronze cont.
- 1—Pfaudler C-12 Rotary Filter, stainless
- 2—Shriver Filters, 30″x30″ C.I. 34 pl 33 fr
- 3—Sweetland #12 Filters, 36 lvs 4″ centers
- 1—Gaulin Model CGD Homogenizers, 200 GPH
- 22—Stainless Kettles, sizes 60-250 gallons
- 1—Mikro-Pulverizer #2—DH new, priced used
- 2—Charlotte Model 20 Colloid Mills, 20 HP
- 1—Lightnin #SEV Agitator, side entering
- 4—FMC #50 Pulp's, 7½ HP mtr. bronze & S.S.
- 2—Canco Model 08 Closing machines, 46 oz-gal
- 2—Mojonnier Vac. Pans, 3′ diax15′ coil type
- 1—2500 gal S.S. Tanks, 6′ diax12′ str side

PACKAGING EQUIPMENT—Fillers, Cappers, Casers, Labelers. Many sizes, type. Send Inquiry.

GOOD USED EQUIPMENT

MACHINERY AND EQUIPMENT COMPANY — GO WEST

514 Bryant Street • San Francisco 7, Calif.

IMC

ADD "PLUS" TO YOUR PRODUCTION WITH GOOD FMC EQUIPMENT

NEW FALCON Ribbon Blenders or Mixers in Mild or Stainless Steel; all sizes
NEW Stainless Steel Steam Jacketed Kettles and Tanks; all sizes
Special Lot of Stainless Clad Kettles; Steam Jacketed; 80 gal. capacity
Copper Kettles up to 250 gal.; Glass Lined to 3000 Gal.; Aluminum to 80 Gal.
VACUUM PANS: Pfaudler Glass Lined 500 and 1000 gal., Aluminum or Copper 250 Gal.
2 Mojonnier Stainless Vacuum Pans with Calandria or Condensers; 3′ x 10′; 6′ x 12′
Sterilizers 48″x42″x96″; 36″x42″x84″; Ft. Wayne 61″x126″; others
Double Drum Dryers: 32″x72″; 42″x100″; Twin Dryers 42″x120″
Food Machinery Corp. Retorts: Standard 42″x72″ Vertical
American Utensil (CRCO) Model "B" Juice Extractor with 5 HP Motor
Marco Stainless Homogenizer Model 400; 10 HP
DICERS by Sterling and Anderson; Rotary Cutters by Abbe, Ball & Jewell, Munson
Sterling and Blakeslee Potato Peelers: Various sizes; Coffee & Meat Grinders
Robinson and Bauer Double Runner Attrition Mills: 24″ and 18″ with 2 Motors
Hammer Mills, Grinders, Crushers by Williams, Gruendler, Jay Bee, Mikro, etc.
Sprout Waldron 2 Pair High Roller Mill: 9″x18″; Robinson Unique 4 Roll 7″x24″
SIFTERS: Rotex 30″x60″; Potterson Gyro 3 Deck 20″x84″
Robinson Unique S.S. 20″x70″; Ajax Vibratory in S.S. 18″x48″
Robinson Gyro Double Deck 20″x90″; Selectro 18″x48″ & 24″x84″
J. H. Day Egg Clipper Mixers: 20″x22″x28″ and 32″x32″x25″
Savage Marshmallow Beater: 200 lb. Capacity; arranger for M.D.
FILLER: Stokes & Smith Powder Filler, Semi and Automatic Models
Triangle Electric-Pak 4 Station Conveyor Type Filler
Gump Bar-Num Vibrox Barrel Packers
Berlin Chapman Syruper Type Liquid Filler up to 60 3 Cans
Berlin Chapman Stainless Steel Spout Filler up to No. 10's
Horix Stainless Steel 14 Stem Gravity-Vacuum Fillers up to qts.
Karl Kiefer 2 Stream Vari Visco Filler for Liquids and Semi-Liquids
Karl Kiefer Rotary Vacuum Fillers with 12, 16 and 18 Stations
LABELERS: Can Labelers by Standard Knapp, Burt, Kyler, Nu-Method and others
Bottle Labelers by New Jersey, World, Ermold, Pneumatic Scale, others
Piston Fillers from 1 to 11 Pistons, by Elgin Filler M Co., Bridge, etc.
M. & S. Stainless Steel 10 Pocket Hi Speed Fillers
CAPPERS: Pneumatic Scale 4 Head Auto Capper; Capem 4 Head Model B2F; Resina
Johnson Automatic Wrapper for Frozen Food Packages; adjustable within limits
Standard Knapp Automatic Gluer & Sealer No. 429-600 Series complete
SPECIAL AGITATORS at less than Half Price: Top Entering 5 HP S.S. 240 RPM

The above list represents only the more important units; if you do not see listed the items you need, do not hesitate to send us your inquiry.

SEND US YOUR LIST OF SURPLUS EQUIPMENT

FIRST MACHINERY CORP.

209-289 TENTH STREET, BROOKLYN 15, N. Y.
PARKING ON THE PREMISES
PHONE: STerling 8-4672

FRED FIRSTENBERG *President*

Cable "EFFEMCY"

BARGAINS FOR SALE

The Ruderman Machinery Exchange of Gouverneur, N. Y., one of the largest diversified Machinery & Equipment Dealers in America, can furnish you with practically all your needs in Modern Ice Cream, Milk Plant and Electrical Equipment at but a fraction of the original cost.

WRITE—WIRE—PHONE FOR YOUR NEEDS

RUDERMAN MACHINERY EXCHANGE
Gouverneur, New York Telephone: 333-334

FOR SALE

30″ Copper Coating Pans with stem coils
300 gal. Copper Still with condenser and tank
100 qt. 3 speed Read Master Mixer
80 qt. M-80-4 speed Hobart Mixer
100 gal. Copper Steam Jacketed Mixing Kettle
York Freon Compressor with 1½ HP 3 phase motor
Burns Split Nut Peanut Blancher

SAVAGE BROS. CO.
2836 Gladys Ave. Chicago 12, Ill.

SEPTEMBER SPECIALS

MRM 12 spouts S/S straight line Vacuum Filler
FMC Hand Packed S/S Filler, #MH1699
S/S Piston Fillers, all makes and sizes.
FMC 6 valve S/S Can Filler takes up to gals.
World Twin Turret Labeler, #C10006, 120 per min.
Pneumatic Scale Simplex & Duplex Labelers
3 Pony Labelers, 86MXX, 86ML & 86MX.
Wrap Around Labelers, all makes and sizes.
Pneumatic Scale Air Cleaner, serial #1216I
Diana Dicer with motor for meats & vegetables.
250 gallon Glass Jktd. & Agtd. Kettle, 3 H.P. exp.
Resina & Capem Cappers, model S-LC & SIF
Screeners 18x48″, 20x24″ & 42x120″
Pfaudler 125 gal. S/S Jktd. & Agtd. Kettle.
316 S/S single drum 3′ x 5′ Dryer, 5 H.P.

NEW—STEEL & S/S MIXERS, KETTLES & TANKS Fabricated To Your Specifications. Engineering Advice Available.

WE BUY COMPLETE PLANTS OR SINGLE UNITS. WHAT HAVE YOU FOR SALE?

YOU CAN BANK ON

EQUIPMENT CLEARING HOUSE, Inc.
111 33rd Street — Brooklyn 32, N. Y.
SOuth 8-4451—4452—8782

LOEB OFFERINGS

Boilers: 15 hp. Eclipse, 60 hp. Sellers, gas.
Cappers: automatic and semi-automatic.
Centrifugals: Fletcher 12" copper, 17" stainless, 20" lithcoated, Tolhurst 26" rubber covered.
Clarifiers: De Laval model 84-51.
Conveyors: screw, 4", 6", stain. steel.
Deodorizer: Rogers 40" stain. steel.
Dryers: Link Belt MonoTube, monel.
Dryer: Hardinge 3' x 24' hot air.
Dryer: Devine 2 x 4' vac. drum, st. steel.
Dryer: Bowen lab. spray, st. steel.
Dryer: Direct Heat 4' x 20'.
Dryer: Nordyke-Marmon 120 bu.
Fillers, liquid: vacuum, siphon, gravity.
Fillers, piston: Stokes, Colton, Elgin, Filler Machine Co. for jars, tubes.
Fillers: M & S for cans 6 and 10 pocket, st. st.
Fillers, powder: Speedee, Triangle, Stokes & Smith, Ferguson, Gump.
Filter Presses: Sperry, Shriver 6"-36", recessed and plate and frames types.
Filters: Int. pressure—Alsop, Sparkler, Lomax, Industrial, Sweetland.
Filter, vacuum: Oliver 2½ x 1'.
Grinder: Enterprise, 7½ hp. motor, 6".
Homogenizers: Manton-Gaulin 25 GPH., 60 GPH., 300 GPH., Flowmaster model 200.
Kettles: Dopp 150 gal., jkt. agitated.
Kettles, Stainless steel: 20 to 500 gal., with and without agitators.
Labelers: Burt, Knapp, New Jersey, World, Ermold—auto and semi-auto.
Mills, hammer: Mikro, Gump, Prater, Raymond, Jay Bee, Jeffrey, Williams, Fitzpatrick.
Mills, colloid: Charlotte 20 hp., 1 hp.
Mixers, dough type: single and double arm. Glen Power Plus 340 qt., 5 hp.
Powder: 50 to 2000 lb. capacity.
Gemco 5' x 14', stain. steel.
Portable Electric: ¼ to 5 hp.
Day high speed, 40 hp.
Muller: Simpson 39½" type 316 s.s. bowl.
Pumps: Centrifugal, rotary, gear, vacuum.
Screens: Selectro 4 x 10', 3 deck.
Sealers: Ferguson, Triangle, Ceco.
Separator: De Laval Nozzle-Matic AC VO.
Sterilizer: American 42" x 52" x 11½' long.
Still, water: Barnstead 75 gal.
Tablet Presses: Single punch and rotary.
Tanks: Stain. steel 25 gal. to 1200 gal.
Tank: St. steel 2000 gal. type 316, jack.

JUST RECEIVED FROM A CREAMERY:

Kettles: 500 gal. st. steel, 100# WP.
Vacuum Pan: 42" Harris, st. steel.
Clarifier: De Laval model AD-RO.
Super Centrifuge: Sharples st. steel.
Wrapper: Globe-Knapp for butter.

Send us your inquiries and list of idle equipment

LOEB EQUIPMENT SUPPLY CO.

820 West Superior St. — **Chicago 22, Ill.**
Telephone Seeley 8-1431 — **Our 33rd Year**

FOR SALE

20 & 40 H.P. "Packaged" Boilers.
150 gal. Pfaudler S.S. Tank, bot. agit.
100 to 400 gal. S.S. Mix Tanks, water jkt.
250 gal. Vert. S.S. Tank, insul., agit.
500 gal. Vert. S.S. Tank 50"x64", insul.
500 gal. Horiz. S.S. Tank 48"x66".
300 gal. Pfaudler G.L. Tank, S.S. Coil.
125 to 1500 gal. Homogenizers or Viscolizers
Hope Two Plunger Filler, s.s.
40 gal. S.S. Jacketed Kettle, agit.
7½ H.P. G.E. Freon Compressor Unit.
Baltimore Aircoil Water Cooling Tower, 90 G.P.M.
O'Brien Vegetable Dicer
Hollymatic Hamburger Patty Maker
Cleveland Range Steam Cooker
Milk Pasteurizers, Coolers, Fillers, Washers

Send us your inquiries.

LESTER KEHOE MACHINERY CORP.
23 Congress St. — P.O. Box 82
Staten Island 4, N. Y. — Gibraltar 7-3410

FOR SALE

DOUBLE DRUM DRYER—42" dia. x 120" lg. American complete with drive, conveyors, elevator, hood, etc. Built for 125 PSI. Used on milk. Excellent. Reasonable.
DOUBLE DRUM DRYER—42" x 100" Buflovac, same specs.
S/S TRUCK TANKS: Three—3,000 gal. insulated on semi-trailers.
S/S TRUCK TANK: 2,500 gal. insulated, suitable to mount on truck body.
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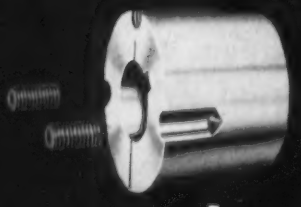

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205b Fillers

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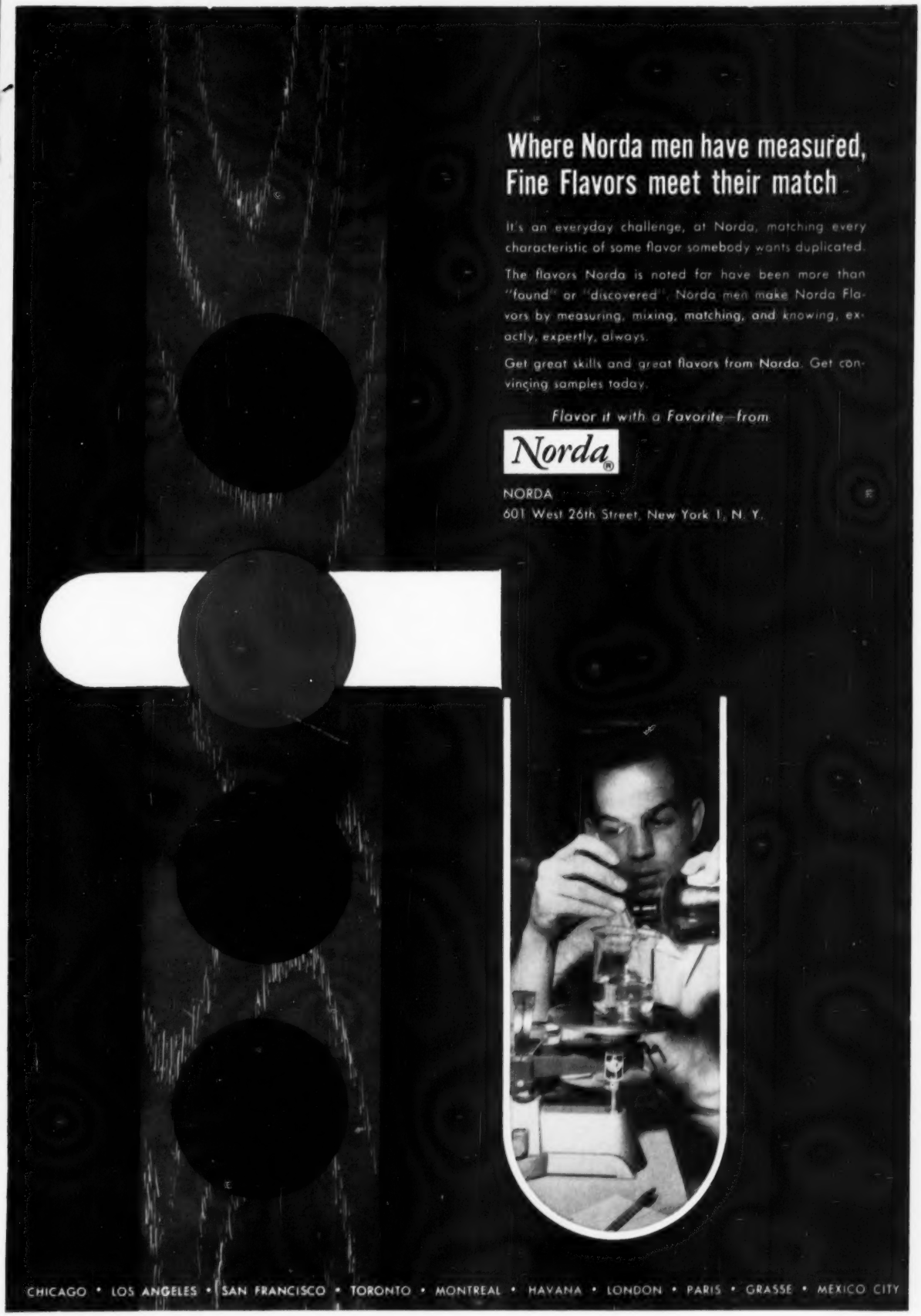
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